
Florida Fish and Wildlife Conservation Commission
Fish & Wildlife Research Institute



**Fisheries-Independent
Monitoring Program
2007 Annual
Data Summary Report**

Compiled by the Fisheries-Independent Monitoring Program Staff
Fish & Wildlife Research Institute

100 8th Avenue SE

St. Petersburg, FL 33701

Telephone: (727) 896-8626

Fax: (727) 823-0166



Data presented in this report are preliminary in nature and may not be used without the prior written consent of Robert McMichael. This research is funded in part by the Department of the Interior, U.S. Fish and Wildlife Service Federal Aid for Sport Fish Restoration, Project F-43 and by funds from Florida Saltwater Fishing License sales.

Overview

This report provides a summary of the data collected in 2007 by the Florida Fish and Wildlife Conservation Commission (FWC) Fish and Wildlife Research Institute's (FWRI) Fisheries-Independent Monitoring (FIM) program. Monitoring was conducted monthly using a stratified-random sampling (SRS) design in Tampa Bay, Charlotte Harbor, the northern Indian River Lagoon, Cedar Key, the southern Indian River Lagoon, Apalachicola Bay, the Florida Keys, and northeast Florida. Gears used for routine monitoring in the various areas included 21.3-m seines, 6.1-m otter trawls, and 183-m haul. A visual survey of Selected Reef Fish Species was conducted in the Florida Keys (Table OV07-01).

There were 2,330,419 animals collected or observed in 8,070 samples from all study areas (Figure OV07-01). The majority of samples were collected with 21.3-m seines (n=3,584), followed by 6.1-m otter trawls (n=1,944), 183-m haul seines (n=1,538), and visual surveys (n=1,004). Total sampling effort in the study areas ranged from 192 hauls made in the southern Indian River Lagoon to 1,716 hauls made in Charlotte Harbor. The total number of animals collected ranged from 21,111 in the southern Indian River Lagoon to 683,793 in Charlotte Harbor (Table OV07-02). The majority of animals were collected in 21.3-m seines (n=1,780,149; 76.4% of the total catch).

In all study areas where SRS with nets was conducted, samples were dominated by small fishes such as *Anchoa mitchilli*, *Lagodon rhomboides*, *Leiostomus xanthurus*, *Menidia* spp., and *Eucinostomus* spp. Recreationally and commercially important animals (i.e., Selected Taxa; see Table FIM07-02) accounted for 9.5% (n=221,510) of the overall catch in these areas and comprised between 2.9% (Charlotte Harbor) and 24.0% (Apalachicola Bay) of the total SRS catches from each study area. Selected Taxa were among the 10 most abundant taxa in some areas: *Mugil cephalus* in Tampa Bay; *Mugil curema* in the northern Indian River Lagoon; *L. xanthurus* and *M. cephalus* in Cedar Key; *M. curema*, *Archosargus probatocephalus*, *M. cephalus*, *Centropomus undecimalis*, and *Elops saurus* in the southern Indian River Lagoon; *L. xanthurus*, *Micropogonias undulatus*, *Cynoscion arenarius*, and *M. cephalus* in Apalachicola Bay;

and *M. undulatus*, *L. xanthurus*, *L. setiferus*, and *M. cephalus* in northeast Florida (Tables OV07-03 and –04). The majority of the Selected Reef Fish observed at visual survey sites in the Florida Keys (72.3%) were haemulids; 50 Selected Reef Fish taxa were observed during this survey.

Seasonal directed sampling with trammel nets for *M. cephalus* was conducted during the winter (January through March) and fall (September through December) of 2007 in Tampa Bay and Charlotte Harbor. A total of 3,901 *M. cephalus* were collected (67 net sets) in Tampa Bay and 1,731 *M. cephalus* were collected (37 net sets) in Charlotte Harbor (see Directed Sampling section).

For fish health monitoring, 413 fish and select invertebrates were observed with an external abnormality (including external parasites). Numbers of reported abnormalities from each study area ranged from 3 (northeast Florida) to 299 (Charlotte Harbor; see Fish Health section).

Species profiles, including indices of young-of-the-year relative abundance, were generated for many species of commercial, recreational, or ecological importance: *Sciaenops ocellatus* (red drum), *Cynoscion nebulosus* (spotted seatrout), *A. probatocephalus* (sheepshead), *M. cephalus* (striped mullet), *L. rhomboides* (pinfish), *C. undecimalis* (common snook), and *Callinectes sapidus* (blue crab; see Species Profile section).

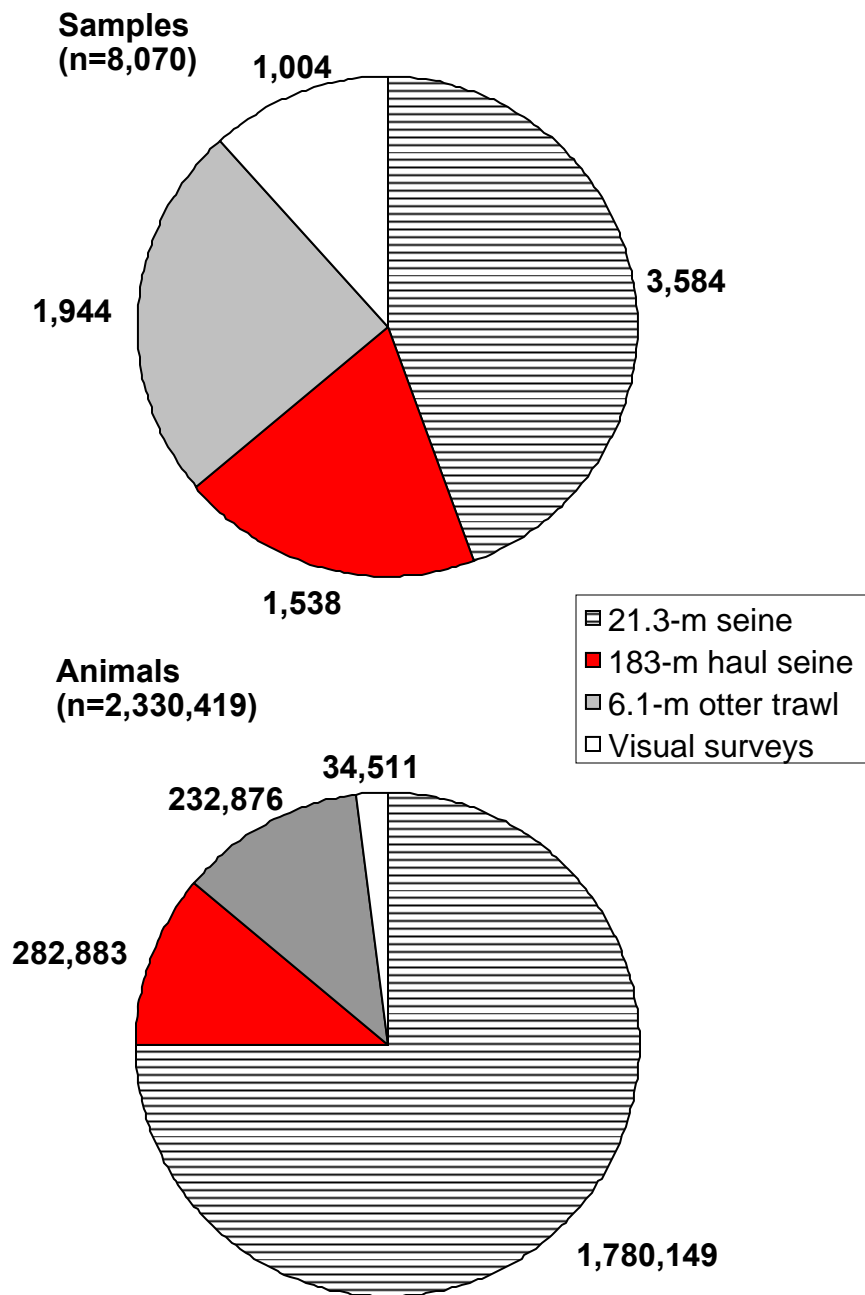


Figure OV07-01. Summary of 2007 FIM program catch and effort data. 'Samples' are the total number of deployments by gear (or number of visual surveys), and 'Animals' are the total number of animals collected by each sampling method (or observed by visual survey).

Table OV07-01. Gear usage by field laboratories for FIM program stratified-random sampling, 2007.

Field Lab	21.3-m Seines		183-m	6.1-m	Visual
	Bay	River	Haul Seines	Otter Trawls	Surveys
Tampa Bay	X	X	X	X	
Charlotte Harbor	X	X	X	X	
N. Indian River	X	X	X	X	
Cedar Key	X	X	X	X	
S. Indian River			X		
Apalachicola	X	X	X	X	
Florida Keys					X
Northeast Florida		X	X	X	

Table OV07-02.

Summary of catch and effort data by area for FIM program stratified-random sampling, 2007. 'Hauls' are the total number of net deployments by each gear, and 'Animals' are the total number of animals collected by each sampling method.

Gear	Tampa Bay		Charlotte Harbor	
	Hauls	Animals	Hauls	Animals
21.3-m seine	672	430,212	924	569,074
183-m haul seine	240	56,822	276	70,487
6.1-m otter trawl	336	34,109	516	44,232
Totals	1,248	521,143	1,716	683,793

Gear	N. Indian River Lagoon		Cedar Key	
	Hauls	Animals	Hauls	Animals
21.3-m seine	597	409,197	420	139,876
183-m haul seine	230	34,043	192	31,740
6.1-m otter trawl	96	6,050	180	35,432
Totals	923	449,290	792	207,048

Gear	S. Indian River Lagoon		Apalachicola Bay	
	Hauls	Animals	Hauls	Animals
21.3-m seine	.	.	395	69,466
183-m haul seine	192	22,111	216	45,091
6.1-m otter trawl	.	.	228	76,938
Totals	192	22,111	839	191,495

Gear	Florida Keys		Northeast Florida	
	Observations	Animals	Hauls	Animals
21.3-m seine	.	.	576	162,324
183-m haul seine	.	.	192	22,589
6.1-m otter trawl	.	.	588	36,115
Visual surveys	1004	34,511		
Totals	1004	34,511	1,356	221,028

Table OV07-03. Top 10 numerically dominant taxa collected in FIM program stratified-random sample areas, 2007.

Tampa Bay		Charlotte Harbor	
Scientific Name	Number	Scientific Name	Number
<i>Anchoa mitchilli</i>	328,294	<i>Anchoa mitchilli</i>	354,113
<i>Lagodon rhomboides</i>	44,334	<i>Lagodon rhomboides</i>	85,970
<i>Menidia</i> spp.	21,236	<i>Eucinostomus</i> spp.	50,231
<i>Eucinostomus</i> spp.	16,959	<i>Lucania parva</i>	39,990
<i>Harengula jaguana</i>	13,027	<i>Menidia</i> spp.	26,773
<i>Eucinostomus gula</i>	12,079	<i>Eucinostomus gula</i>	26,689
<i>Eucinostomus harengulus</i>	11,955	<i>Harengula jaguana</i>	17,530
<i>Lucania parva</i>	11,014	<i>Eucinostomus harengulus</i>	8,486
<i>Mugil cephalus</i>	8,977	<i>Microgobius gulosus</i>	5,758
<i>Floridichthys carpio</i>	5,159	<i>Portunus</i> spp.	5,177
	Σ = 473,034		620,717
Total (Selected Taxa)	23,245		19,506
Grand Total of Animals Collected	521,143		683,793

N. Indian River Lagoon		Cedar Key	
Scientific Name	Number	Scientific Name	Number
<i>Anchoa mitchilli</i>	300,761	<i>Anchoa mitchilli</i>	117,989
<i>Lucania parva</i>	22,217	<i>Lagodon rhomboides</i>	18,606
<i>Eucinostomus</i> spp.	18,410	<i>Leiostomus xanthurus</i>	16,041
<i>Diapterus auratus</i>	17,822	<i>Bairdiella chrysoura</i>	8,707
<i>Menidia</i> spp.	14,355	<i>Menidia</i> spp.	5,526
<i>Lagodon rhomboides</i>	7,071	<i>Anchoa hepsetus</i>	3,492
<i>Microgobius gulosus</i>	5,698	<i>Orthopristis chrysoptera</i>	3,254
<i>Eucinostomus harengulus</i>	4,746	<i>Ariopsis felis</i>	3,015
<i>Bairdiella chrysoura</i>	4,610	<i>Eucinostomus</i> spp.	2,782
<i>Mugil curema</i>	3,906	<i>Mugil cephalus</i>	2,742
	Σ = 399,596		182,154
Total (Selected Taxa)	19,771		27,491
Grand Total of Animals Collected	449,290		207,048

Table OV07-03. Continued)

S. Indian River Lagoon		Apalachicola Bay	
Scientific Name	Number	Scientific Name	Number
<i>Lagodon rhomboides</i>	5,263	<i>Anchoa mitchilli</i>	60,530
<i>Diapterus auratus</i>	5,131	<i>Lagodon rhomboides</i>	30,983
<i>Eucinostomus gula</i>	1,103	<i>Brevoortia</i> spp.	14,395
<i>Mugil curema</i>	972	<i>Leiostomus xanthurus</i>	13,029
<i>Selene vomer</i>	962	<i>Micropogonias undulatus</i>	10,129
<i>Archosargus probatocephalus</i>	852	<i>Cynoscion arenarius</i>	5,897
<i>Mugil cephalus</i>	767	<i>Menidia</i> spp.	5,083
<i>Orthopristis chrysoptera</i>	743	<i>Mugil cephalus</i>	4,868
<i>Centropomus undecimalis</i>	565	<i>Eucinostomus</i> spp.	4,092
<i>Elops saurus</i>	543	<i>Bairdiella chrysoura</i>	3,535
	Σ = 16,901		152,541
Total (Selected Taxa)	4,990		46,040
Grand Total of Animals Collected	22,111		191,495

Florida Keys		Northeast Florida	
Scientific Name	Number	Scientific Name	Number
<i>Haemulon plumierii</i>	6,988	<i>Anchoa mitchilli</i>	73,465
<i>Haemulon aurolineatum</i>	6,536	<i>Anchoa hepsetus</i>	18,340
<i>Haemulon</i> spp.	3,994	<i>Lucania parva</i>	14,718
<i>Ocyurus chrysurus</i>	3,563	<i>Micropogonias undulatus</i>	13,632
<i>Haemulon flavolineatum</i>	2,846	<i>Menidia menidia</i>	13,122
<i>Haemulon sciurus</i>	2,228	<i>Menidia</i> spp.	9,925
<i>Haemulon melanurum</i>	1,223	<i>Leiostomus xanthurus</i>	8,884
<i>Lutjanus griseus</i>	1,046	<i>Litopenaeus setiferus</i>	7,370
<i>Lachnolaimus maximus</i>	935	<i>Dorosoma petenense</i>	5,598
<i>Lutjanus apodus</i>	632	<i>Mugil cephalus</i>	5,478
	Σ = 29,991		170,532
Total (Selected Taxa)	34,511		45,956
Grand Total of Animals Collected	34,511		221,028

Table OV07-04. Number of recreational or commercially important species (Selected Taxa) collected in the FIM program stratified-random sample areas, 2007

Tampa Bay		Charlotte Harbor	
Scientific Name	Number	Scientific Name	Number
<i>Mugil cephalus</i>	8,977	<i>Farfantepenaeus duorarum</i>	4,899
<i>Farfantepenaeus duorarum</i>	2,919	<i>Callinectes sapidus</i>	2,207
<i>Callinectes sapidus</i>	2,176	<i>Lutjanus griseus</i>	1,916
<i>Leiostomus xanthurus</i>	1,319	<i>Menticirrhus americanus</i>	1,423
<i>Centropomus undecimalis</i>	1,178	<i>Mugil gyrans</i>	1,255
<i>Cynoscion arenarius</i>	1,106	<i>Cynoscion arenarius</i>	942
<i>Mugil curema</i>	939	<i>Centropomus undecimalis</i>	915
<i>Elops saurus</i>	931	<i>Mugil cephalus</i>	898
<i>Archosargus probatocephalus</i>	711	<i>Elops saurus</i>	781
<i>Cynoscion nebulosus</i>	558	<i>Lutjanus synagris</i>	705
<i>Lutjanus griseus</i>	525	<i>Archosargus probatocephalus</i>	702
<i>Mugil gyrans</i>	435	<i>Mugil curema</i>	659
<i>Sciaenops ocellatus</i>	385	<i>Cynoscion nebulosus</i>	521
<i>Menticirrhus americanus</i>	376	<i>Sciaenops ocellatus</i>	475
<i>Menippe spp.</i>	241	<i>Menippe spp.</i>	362
<i>Paralichthys albigutta</i>	125	<i>Mycteroperca microlepis</i>	228
<i>Mycteroperca microlepis</i>	103	<i>Leiostomus xanthurus</i>	212
<i>Menticirrhus saxatilis</i>	65	<i>Paralichthys albigutta</i>	139
<i>Trachinotus falcatus</i>	53	<i>Trachinotus falcatus</i>	125
<i>Lutjanus synagris</i>	40	<i>Menticirrhus saxatilis</i>	24
<i>Trachinotus carolinus</i>	26	<i>Trachinotus carolinus</i>	23
<i>Pomatomus saltatrix</i>	23	<i>Pogonias cromis</i>	20
<i>Pogonias cromis</i>	12	<i>Epinephelus itajara</i>	19
<i>Scomberomorus maculatus</i>	11	<i>Scomberomorus maculatus</i>	18
<i>Menticirrhus littoralis</i>	4	<i>Epinephelus morio</i>	16
<i>Epinephelus itajara</i>	3	<i>Albula vulpes</i>	7
<i>Rachycentron canadum</i>	3	<i>Menticirrhus littoralis</i>	5
<i>Megalops atlanticus</i>	1	<i>Rachycentron canadum</i>	5
		<i>Pomatomus saltatrix</i>	3
		<i>Megalops atlanticus</i>	2
Total	23,245	Total	19,506

Table OV07-04. (Continued)

N. Indian River Lagoon		Cedar Key	
Scientific Name	Number	Scientific Name	Number
<i>Mugil curema</i>	3,906	<i>Leiostomus xanthurus</i>	16,041
<i>Mugil cephalus</i>	3,289	<i>Mugil cephalus</i>	2,742
<i>Callinectes sapidus</i>	1,776	<i>Callinectes sapidus</i>	2,089
<i>Farfantepenaeus</i> spp.	1,709	<i>Farfantepenaeus duorarum</i>	1,235
<i>Centropomus undecimalis</i>	1,642	<i>Cynoscion arenarius</i>	1,149
<i>Archosargus probatocephalus</i>	1,439	<i>Elops saurus</i>	741
<i>Sciaenops ocellatus</i>	1,084	<i>Menticirrhus americanus</i>	675
<i>Elops saurus</i>	975	<i>Sciaenops ocellatus</i>	573
<i>Micropogonias undulatus</i>	882	<i>Mugil curema</i>	395
<i>Cynoscion nebulosus</i>	641	<i>Paralichthys albigutta</i>	373
<i>Litopenaeus setiferus</i>	461	<i>Pogonias cromis</i>	357
<i>Menticirrhus americanus</i>	340	<i>Cynoscion nebulosus</i>	299
<i>Lutjanus griseus</i>	315	<i>Menippe</i> spp.	245
<i>Leiostomus xanthurus</i>	295	<i>Archosargus probatocephalus</i>	187
<i>Farfantepenaeus duorarum</i>	237	<i>Pomatomus saltatrix</i>	102
<i>Trachinotus falcatus</i>	233	<i>Lutjanus griseus</i>	86
<i>Pogonias cromis</i>	131	<i>Mugil gyrans</i>	61
<i>Lutjanus synagris</i>	80	<i>Micropogonias undulatus</i>	39
<i>Cynoscion complex</i>	79	<i>Scomberomorus maculatus</i>	38
<i>Lutjanus analis</i>	79	<i>Menticirrhus saxatilis</i>	26
<i>Paralichthys albigutta</i>	43	<i>Mycteroperca microlepis</i>	11
<i>Albula vulpes</i>	41	<i>Trachinotus falcatus</i>	11
<i>Scomberomorus maculatus</i>	21	<i>Lutjanus synagris</i>	7
<i>Trachinotus carolinus</i>	19	<i>Cynoscion</i> spp.	3
<i>Mycteroperca microlepis</i>	16	<i>Paralichthys lethostigma</i>	3
<i>Farfantepenaeus aztecus</i>	9	<i>Megalops atlanticus</i>	2
<i>Pomatomus saltatrix</i>	9	<i>Centropomus undecimalis</i>	1
<i>Lutjanus jocu</i>	7		
<i>Paralichthys lethostigma</i>	4		
<i>Menippe</i> spp.	2		
<i>Mycteroperca bonaci</i>	2		
<i>Epinephelus itajara</i>	1		
<i>Farfantepenaeus brasiliensis</i>	1		
<i>Megalops atlanticus</i>	1		
<i>Mugil gyrans</i>	1		
<i>Scomberomorus regalis</i>	1		
Total	19,771	Total	27,491

Table OV07-04. (Continued)

S. Indian River Lagoon		Apalachicola Bay	
Scientific Name	Number	Scientific Name	Number
<i>Mugil curema</i>	972	<i>Leiostomus xanthurus</i>	13,029
<i>Archosargus probatocephalus</i>	852	<i>Micropogonias undulatus</i>	10,129
<i>Mugil cephalus</i>	767	<i>Cynoscion arenarius</i>	5,897
<i>Centropomus undecimalis</i>	565	<i>Mugil cephalus</i>	4,868
<i>Elops saurus</i>	543	<i>Litopenaeus setiferus</i>	2,513
<i>Micropogonias undulatus</i>	289	<i>Callinectes sapidus</i>	2,413
<i>Lutjanus analis</i>	262	<i>Farfantepenaeus</i> spp.	2,304
<i>Callinectes sapidus</i>	181	<i>Mugil curema</i>	1,389
<i>Lutjanus griseus</i>	166	<i>Sciaenops ocellatus</i>	549
<i>Pogonias cromis</i>	131	<i>Menticirrhus americanus</i>	414
<i>Lutjanus synagris</i>	68	<i>Cynoscion nebulosus</i>	406
<i>Menticirrhus americanus</i>	30	<i>Elops saurus</i>	372
<i>Sciaenops ocellatus</i>	28	<i>Farfantepenaeus aztecus</i>	322
<i>Paralichthys albigutta</i>	27	<i>Paralichthys albigutta</i>	224
<i>Cynoscion nebulosus</i>	14	<i>Lutjanus synagris</i>	212
<i>Mycteroperca microlepis</i>	11	<i>Archosargus probatocephalus</i>	207
<i>Trachinotus falcatus</i>	10	<i>Farfantepenaeus duorarum</i>	206
<i>Leiostomus xanthurus</i>	10	<i>Mycteroperca microlepis</i>	136
<i>Epinephelus itajara</i>	10	<i>Pomatomus saltatrix</i>	101
<i>Scomberomorus maculatus</i>	9	<i>Lutjanus griseus</i>	60
<i>Paralichthys lethostigma</i>	7	<i>Trachinotus carolinus</i>	60
<i>Epinephelus morio</i>	7	<i>Menippe</i> spp.	55
<i>Scomberomorus regalis</i>	6	<i>Pogonias cromis</i>	42
<i>Albula vulpes</i>	6	<i>Paralichthys lethostigma</i>	36
<i>Mycteroperca bonaci</i>	6	<i>Menticirrhus saxatilis</i>	25
<i>Pomatomus saltatrix</i>	5	<i>Scomberomorus maculatus</i>	25
<i>Trachinotus carolinus</i>	3	<i>Menticirrhus littoralis</i>	17
<i>Cynoscion arenarius</i>	3	<i>Trachinotus falcatus</i>	10
<i>Farfantepenaeus duorarum</i>	1	<i>Paralichthys squamilentus</i>	9
<i>Megalops atlanticus</i>	1	<i>Cynoscion nothus</i>	8
		<i>Lutjanus jocu</i>	1
		<i>Penaeidae</i> sp.	1
Total	4,990	Total	46,040

Table OV07-04. (Continued)

Florida Keys			
Visual Surveys			
Scientific Name	Number	Scientific Name	Number
<i>Haemulon plumierii</i>	6,988	<i>Epinephelus morio</i>	82
<i>Haemulon aurolineatum</i>	6,536	<i>Pomacanthus paru</i>	82
<i>Haemulon spp.</i>	3,994	<i>Chaetodon striatus</i>	73
<i>Ocyurus chrysurus</i>	3,563	<i>Epinephelus adscensionis</i>	36
<i>Haemulon flavolineatum</i>	2,846	<i>Balistes capriscus</i>	36
<i>Haemulon sciurus</i>	2,228	<i>Mycteroperca phenax</i>	32
<i>Haemulon melanurum</i>	1,223	<i>Bodianus pulchellus</i>	30
<i>Lutjanus griseus</i>	1,046	<i>Cephalopholis fulva</i>	25
<i>Lachnolaimus maximus</i>	935	<i>Haemulon macrostomum</i>	20
<i>Lutjanus apodus</i>	632	<i>Haemulon carbonarium</i>	30
<i>Anisotremus virginicus</i>	579	<i>Balistes vetula</i>	14
<i>Chaetodon capistratus</i>	477	<i>Mycteroperca interstitialis</i>	11
<i>Pomacanthus arcuatus</i>	440	<i>Mycteroperca microlepis</i>	10
<i>Chaetodon sedentarius</i>	319	<i>Lutjanus buccanella</i>	10
<i>Chaetodon ocellatus</i>	303	<i>Epinephelus itajara</i>	8
<i>Holacanthus tricolor</i>	260	<i>Anisotremus surinamensis</i>	6
<i>Lutjanus analis</i>	211	<i>Epinephelus striatus</i>	5
<i>Haemulon striatum</i>	234	<i>Heteropriacanthus cruentatus</i>	5
<i>Cephalopholis cruentata</i>	205	<i>Epinephelus guttatus</i>	4
<i>Holacanthus ciliaris</i>	165	<i>Lutjanus mahogoni</i>	4
<i>Lutjanus synagris</i>	169	<i>Haemulon album</i>	3
<i>Bodianus rufus</i>	134	<i>Canthidermis sufflamen</i>	3
<i>Mycteroperca bonaci</i>	126	<i>Lutjanus cyanopterus</i>	2
<i>Holacanthus bermudensis</i>	111	<i>Lutjanus jocu</i>	2
<i>Haemulon parra</i>	123	<i>Priacanthus arenatus</i>	1
<i>Haemulon chrysargyreum</i>	130		
Total			34,511

Table OV07-04. (Continued)

Northeast Florida	
Scientific Name	Number
<i>Micropogonias undulatus</i>	13,632
<i>Leiostomus xanthurus</i>	8,884
<i>Litopenaeus setiferus</i>	7,370
<i>Mugil cephalus</i>	5,478
<i>Mugil curema</i>	2,987
<i>Callinectes sapidus</i>	2,809
<i>Farfantepenaeus</i> spp.	727
<i>Cynoscion complex</i>	620
<i>Elops saurus</i>	576
<i>Cynoscion nebulosus</i>	524
<i>Farfantepenaeus duorarum</i>	454
<i>Menticirrhus americanus</i>	288
<i>Paralichthys lethostigma</i>	267
<i>Sciaenops ocellatus</i>	228
<i>Paralichthys albigutta</i>	213
<i>Archosargus probatocephalus</i>	195
<i>Trachinotus carolinus</i>	150
<i>Pomatomus saltatrix</i>	125
<i>Pogonias cromis</i>	77
<i>Lutjanus griseus</i>	62
<i>Trachinotus falcatus</i>	62
<i>Farfantepenaeus aztecus</i>	55
<i>Centropomus undecimalis</i>	38
<i>Scomberomorus maculatus</i>	33
<i>Paralichthys dentatus</i>	30
<i>Lutjanus synagris</i>	24
<i>Cynoscion nothus</i>	12
<i>Menticirrhus saxatilis</i>	11
<i>Mycteroperca microlepis</i>	9
<i>Albula vulpes</i>	2
<i>Paralichthys squamilentus</i>	2
<i>Menticirrhus littoralis</i>	1
<i>Rachycentron canadum</i>	1
Total	45,956

Fisheries-Independent Monitoring

Introduction

The Florida Fish and Wildlife Conservation Commission (FWC) Fish and Wildlife Research Institute's (FWRI) Fisheries-Independent Monitoring (FIM) program is a long-term program designed to monitor the relative abundance of fishery resources in Florida's major estuarine, coastal, and reef systems. The program was developed to: 1) address the critical need for effective assessment techniques for an array of species and sizes of fishes and selected invertebrates; 2) provide timely information for use in management plans; and 3) monitor trends in the relative abundance of taxa in a variety of estuarine and marine systems throughout Florida.

Proper management of Florida's marine fisheries resources requires information from a number of sources. Traditional methods of monitoring changes in fish stocks have used catch-per-unit-effort (CPUE) data derived directly from commercial and recreational fisheries. Analysis of these fisheries-dependent data can provide some information on the status of fish stocks; however, there are inherent problems in using data from these sources. Changes in vessel types, fleet size, fishing gear, or methods of operation can make fisheries-dependent data difficult to interpret (Ultang 1977). Additionally, closed seasons, changes in size or bag limits, and fluctuations in market values can further bias catch data and subsequent analyses. Fisheries-independent sampling, which targets juvenile and sub-adult fishes that have not been subjected to fishing pressure, can provide less biased estimates of trends in fish stocks than fisheries-dependent sampling (Myers and Cadigan 1993). Changes in juvenile abundance within a season can be attributed to natural mortality, immigration, emigration, or recruitment. Shifts in juvenile abundance can also be used to forecast changes in the adult stock, allowing necessary modifications to harvest regulations to be implemented before the fish have fully recruited to the fishery (Goodyear 1985). The FIM program was established to provide this type of timely information for use in management plans.

The Fish and Wildlife Research Institute initiated the FIM program in 1985 with funding provided by a Federal Sport Fish Restoration (SFR) grant. In 1988, additional

funding became available from special appropriations. The FIM program is now partially supported by funds from the sale of Florida saltwater fishing licenses as well as the SFR grant. Fisheries-Independent Monitoring program sampling began in Tampa Bay and Charlotte Harbor during 1989, in the northern Indian River Lagoon during 1990, in Cedar Key during 1996, in the southern Indian River Lagoon during 1997, in Apalachicola Bay and the Florida Keys National Marine Sanctuary during 1998, and in northeast Florida during 2001. Sampling was also conducted in Choctawhatchee Bay/Santa Rosa Sound between 1992 and 1997 and in Florida Bay between 1993 and 1997 (Figure FIM07-01).

Florida's coastline extends from subtropical to temperate regions and includes habitats such as seagrass beds, salt marshes, and mangroves. These habitats provide critical nursery areas for many fish and invertebrate species. It is estimated that greater than 70% of the recreationally-important species and greater than 90% of the commercially-important species in the Gulf of Mexico are estuarine-dependent during at least one stage of their life histories (Lindall and Saloman 1997). The FIM program data are summarized and analyzed for all fish and selected invertebrate species collected, yielding information on the relative abundance, recruitment, habitat use, and distribution of hundreds of estuarine and marine species. This approach provides a unique source of information on economically valuable species as well as on many poorly understood non-game species that may influence fisheries or may be important ecological indicators. This type of multi-species, multi-habitat, long-term monitoring program is extremely valuable for documenting ecosystem changes, evaluating the effects of natural and anthropogenic disturbances, and making management decisions (Coull 1985; Wolfe et al. 1987).

Although the FIM program has always used a suite of gears (e.g., seines, trawls, gillnets) capable of capturing a broad range of fish species and sizes from a variety of habitats, initial program efforts focused primarily on collecting young-of-the-year (YOY) fishes that could be used to develop recruitment indices. The program expanded its efforts to monitor larger-sized fishes in Tampa Bay by developing 183-m haul seines (fixed stations sampled between 1993 and 1995; year-round stratified-random sampling [SRS] implemented in 1996), 183-m purse seines (implemented in 1997; discontinued in

2004), and by developing a visual sampling program for reef fishes in the Florida Keys (implemented in 1998). The 183-m haul seine gear was implemented as part of the SRS component of the program in Charlotte Harbor during 1996, in the northern and southern Indian River Lagoon and Cedar Key during 1997, in Apalachicola Bay during 1998, and in northeast Florida during 2001. The purse seine was implemented for SRS in Charlotte Harbor in 1998 and was used on a trial basis in Apalachicola Bay during 2000 and 2001, but was no longer used at any sampling area after 2004. Through the use of visual surveys in the Florida Keys, fisheries-independent information was obtained in this unique area of Florida for the first time in 1998, representing an important expansion of the FIM program. The FIM program also implemented an ongoing seasonal directed sampling program for striped mullet (*Mugil cephalus*) in Tampa Bay and Charlotte Harbor in 1993, utilizing a 366-m trammel net. The entire suite of gears and methods used by the FIM program captures fishes at various stages of development, from initial recruitment into the estuary through harvestable sizes, thereby providing a continuous gauge of a particular stock's relative abundance, age and size composition, and reproductive potential. This report summarizes FIM program SRS data collected during 2007. Results from the sampling efforts in each estuary are presented separately. This report also summarizes directed sampling data for striped mullet and presents results from fish health monitoring of samples collected by the FIM program. Profiles of several species that are of particular interest because of their recreational and commercial value in Florida are also presented and provide critical information for these species while also describing some of the ways the FIM program data are used to assess the status of important Florida fisheries.

Methods

The FIM program uses a stratified-random sampling design in all study areas. Each study area was divided into sampling zones based upon geographic and logistical criteria, and each zone was further subdivided into 1-nm² grids that were randomly selected for sampling. Sampling grids were stratified by habitat and depth, thereby identifying the gear types that could be used in those areas. A single sample was collected at each randomly selected site, except during visual sampling in the Florida

Keys, where multiple censuses (four 5-m radius point counts) were conducted. In most cases, the number of monthly samples collected in each zone with each gear was proportional to the number of grids in the zone that could be sampled with a particular gear.

The FIM program uses a multi-gear approach to collect data on various life history stages of fishes and selected invertebrates from a wide variety of habitats (Table FIM07-01). A 21.3-m center bag seine targeted YOY and juvenile fishes in shallow water (≤ 1.8 -m); a 6.1-m otter trawl targeted YOY, juvenile, and adult fish in deep water (1.0 – 7.6-m); a 183-m haul seine targeted sub-adult and adult fish along shorelines in water depths ≤ 2.5 -m; and visual surveys were conducted to observe reef fishes in the Florida Keys at depths to 30 m. Several different techniques were used, depending upon habitat, to stratify the samples collected with the various gears. The 21.3-m center bag seine was used in Tampa Bay, Charlotte Harbor, the northern Indian River Lagoon, Cedar Key, Apalachicola Bay, and northeast Florida. Two deployment techniques were used. The bay seine technique was used in all estuaries except northeast Florida to sample shallow areas, and was pre-stratified by the presence or absence of bottom vegetation (except in the Cedar Key area) or the presence of a shoreline. The river seine technique was used in all estuaries to sample the shorelines of creeks and rivers. River seine deployments in Tampa Bay and Charlotte Harbor were pre-stratified by the presence or absence of overhanging shoreline vegetation. River seine deployments in the northern Indian River Lagoon, Cedar Key, Apalachicola Bay, and northeast Florida were not pre-stratified by habitat type. Samples collected with 183-m haul seines in Tampa Bay and Charlotte Harbor were pre-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with 183-m haul seines in the northern and southern Indian River Lagoon were post-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with this gear were not stratified by habitat type in Cedar Key, Apalachicola Bay, and northeast Florida. All sampling was conducted during daytime hours (one hour after sunrise to one hour before sunset). Additional sampling details are described in the FIM program's Procedure Manual (FWC-FWRI 2007).

The sample work-up technique was similar for all samples collected with nets, regardless of gear type or sampling regime. Environmental data consisting of water chemistry, habitat characteristics, and physical parameters such as current and tidal conditions were recorded for each sample. All fish and selected invertebrate species captured in net collections were identified to the lowest practical taxonomic level, counted, and a random sample of at least 10 individuals was measured (standard length for teleosts, precaudal length for sharks, disc width for rays, carapace width for crabs, and post-orbital head length for shrimp). During visual census sampling of reef fishes, estimated lengths (natural total length) of selected reef fish species (see Table FK07-01) were recorded using 5-cm length intervals for fishes \leq 60 cm, and using 10-cm intervals for fishes $>$ 60 cm, based on direct observations by trained divers using SCUBA. A detailed explanation of the standard sample work-up and visual survey methodology for data collection is described in the FIM program's Procedure Manual (FWC-FWRI 2007).

Certain taxa were not identified to species because of the possibility of hybridization (e.g., *Brevoortia* spp., *Menidia* spp.; Dahlberg 1970, Middaugh et al. 1986) or because they were morphologically or meristically indistinguishable at small juvenile sizes (e.g., *Eucinostomus* spp. $<$ 40 mm SL; Matheson 1983). In northeast Florida and northern Indian River Lagoon sections, species accounts of *Cynoscion regalis* (weakfish) and *Cynoscion arenarius* (sand seatrout) will be referred to collectively as *Cynoscion* complex. These two species mix and hybridize along the Atlantic coast of Florida and identification can only be determined with certainty by genetic testing (Tringali et al. 2004). Animals were released except for representative samples of each taxon (for laboratory confirmation of field identifications) and samples required for specific research projects. The taxonomic nomenclature in this report follows the American Fisheries Society's Common and Scientific Names of Fishes (Nelson et al. 2004). A detailed explanation of the standard sample work-up for data collection is described in the FIM program's Procedure Manual (FWC-FWRI 2007).

The data for this report were summarized separately for each estuarine system and for each gear type. Data were also summarized separately for all taxa and for taxa of recreational or commercial importance ('Selected Taxa'; Table FIM07-02).

Abundance estimates were calculated for 21.3-m seines, trawls, and visual surveys as the number of individuals/100 m² of area sampled. Catch-per-unit-effort (CPUE) was calculated for 183-m haul seine samples as the number of animals/set. The appendices for each study area describe the catch by month, gear, stratum, and zone.

Study Areas

The FIM program conducted sampling in Tampa Bay, Charlotte Harbor, the northern Indian River Lagoon, Cedar Key, the southern Indian River Lagoon, Apalachicola Bay, the Florida Keys, and northeast Florida (Figure FIM07-01). In all regions except the Florida Keys (where only reef areas were sampled), sampling was conducted over a wide range of habitats encompassing different bottom types, shoreline types, and offshore areas. In addition to sampling in major estuaries, tidally-influenced portions of rivers that flow into Tampa Bay (Alafia, Braden, Little Manatee, and Manatee rivers), Charlotte Harbor (Peace, Myakka, and Caloosahatchee rivers), the Indian River Lagoon (Sebastian and St. Lucie rivers), the Cedar Key area (Suwannee River), Apalachicola Bay (Apalachicola River), and northeast Florida (St. Marys, Nassau, and St. Johns rivers) were sampled. The Tampa Bay, Charlotte Harbor, and northern Indian River Lagoon study areas were described in the FIM Program 1994 Annual Data Summary Report (FDEP-FMRI 1995). The Cedar Key study area was described in the FIM Program 1996 Annual Data Summary Report (FDEP-FMRI 1997); the southern Indian River Lagoon study area was described in the FIM Program 1997 Annual Data Summary Report (FDEP-FMRI 1998); the Apalachicola Bay study area, Florida Keys study area, and changes to the southern Indian River Lagoon study area were described in the FIM Program 1998 Annual Data Summary Report (FWC-FMRI 1999); and the northeast Florida study area was described in the FIM Program 2001 Annual Data Summary Report (FWC-FMRI 2002).

References

- Coull, B.C. 1985. The use of long-term biological data to generate testable hypotheses. *Estuaries* 8:84-92.
- Dahlberg, M.D.1970. Atlantic and Gulf of Mexico menhadens, Genus *Brevoortia* (Pisces: Clupeidae). *Bulletin of the Florida State Museum* 15(3):91-162.
- FDEP-FMRI. 1995. Fisheries-Independent Monitoring Program 1994 Annual Data Summary Report. Florida Marine Research Institute. St. Petersburg, Florida.
- FDEP-FMRI. 1997. Fisheries-Independent Monitoring Program 1996 Annual Data Summary Report. Florida Marine Research Institute. St. Petersburg, Florida.
- FDEP-FMRI. 1998. Fisheries-Independent Monitoring Program 1997 Annual Data Summary Report. Florida Marine Research Institute. St. Petersburg, Florida.
- FWC-FMRI. 1999. Fisheries-Independent Monitoring Program 1998 Annual Data Summary Report. Florida Marine Research Institute. St. Petersburg, Florida.
- FWC-FMRI. 2002. Fisheries-Independent Monitoring Program 2001 Annual Data Summary Report. Florida Marine Research Institute. St. Petersburg, Florida.
- FWC-FWRI. 2007. Fisheries-Independent Monitoring Program Procedure Manual. Florida Fish and Wildlife Research Institute. St. Petersburg, Florida.
- Goodyear, C.P. 1985. Relationship between reported commercial landings and abundance of young striped bass in Chesapeake Bay, Maryland. *Transactions of the American Fisheries Society* 114:92-96.
- Lindall, W.N., and C.H. Saloman. 1997. Alteration and destruction of estuaries affecting fisheries resources in the Gulf of Mexico. *Marine Fisheries Review* 399:1-7.

- Matheson, R.E., Jr. 1983. Taxonomic studies of the *Eucinostomus argenteus* complex (Pisces: Gerreidae). Ph.D. Dissertation, Texas A&M University, College Station. 195 p.
- Middaugh, D.P., M.J. Hemmer, and Y.L. Rose. 1986. Laboratory spawning cues in *Menidia beryllina* and *Menidia peninsulae* (Pisces: Atherinidae) with notes on survival and growth of larvae at different salinities. *Environmental Biology of Fishes* 15:107-117.
- Myers, R.A., and N.G. Cadigan. 1993. Is juvenile mortality in marine demersal fish variable? *Canadian Journal of Fisheries and Aquatic Sciences* 50:1591-1598.
- Nelson, J.S., E.J. Crossman, H. Espinosa-Perez, L.T. Findley, C.R. Gilbert, R.N. Lea, and J.D. Williams. 2004. Common and scientific names of fishes from the United States, Canada and Mexico. Sixth Edition. American Fisheries Society Special Publication 29. 386 pp.
- Tringali, M.D., S. Seyoum, E. Wallace, and M. Higham. 2004. The Distribution of Weakfish (*Cynoscion regalis*), Sand Seatrout (*C. arenarius*), and their hybrids in Florida Atlantic Waters. A special report to the Florida Fish and Wildlife Conservation Commission. June 2004. Florida Fish and Wildlife Research Institute. Report Number IHR2004-018
- Ultang, O. 1977. Methods of measuring stock abundance other than by use of commercial catch and effort data. (FAO Fisheries Technical Paper No. 176).
- Wolfe, D.A., M.A. Champ, D.A. Flemer, and A.J. Mearns. 1987. Long-term biological data sets: their role in research, monitoring, and management of estuarine and coastal marine systems. *Estuaries* 10(3):181-193.

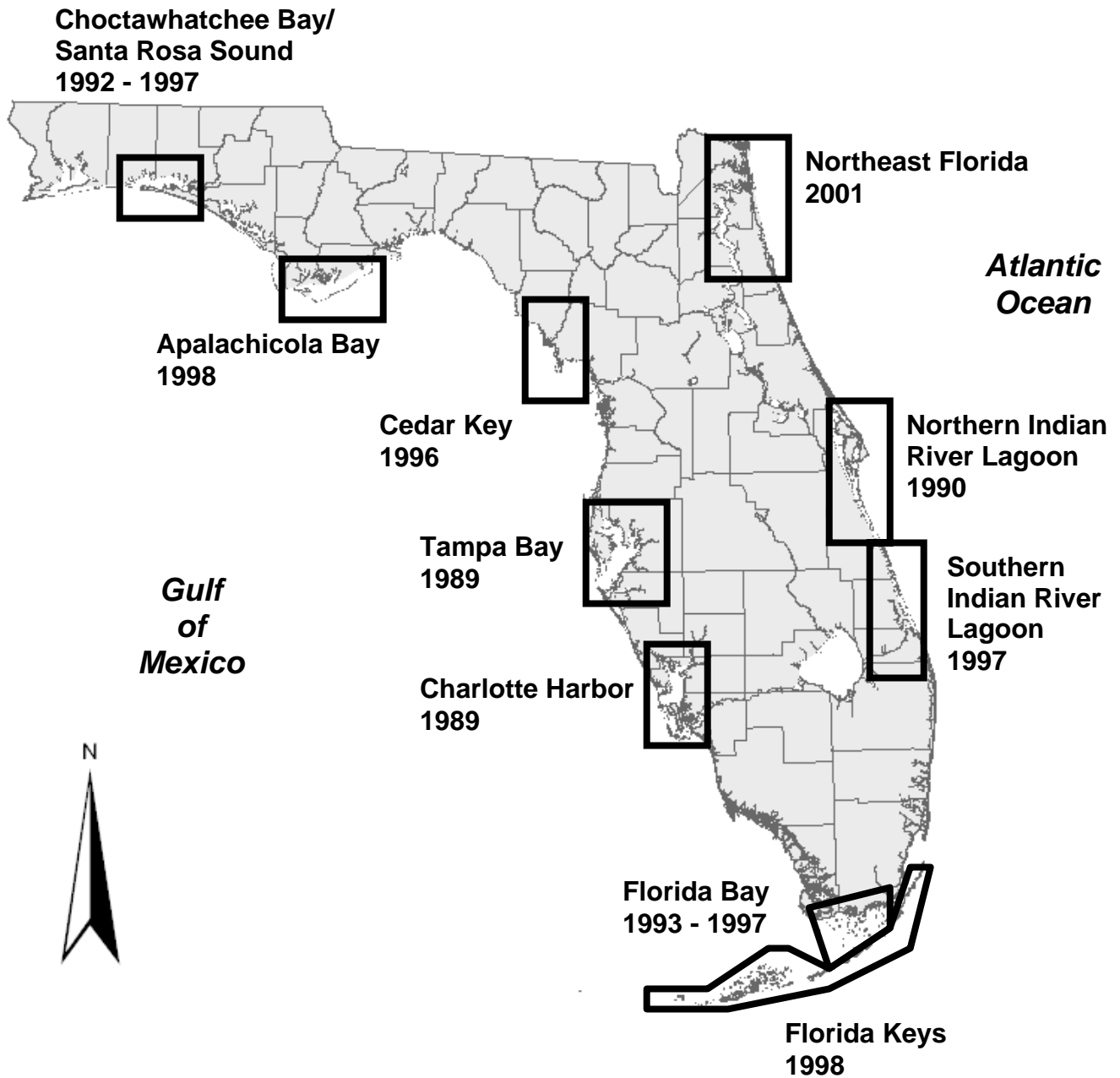


Figure FIM07-01. Locations of Fisheries-Independent Monitoring program field labs. Years indicate initiation of sampling. If sampling was discontinued at a field lab, the last year of sampling is also provided.

Table FIM07-01. Description of monthly monitoring sampling gears used in 2007. A more detailed description of each gear can be found in the FIM program's Procedure Manual.

Gear	Deployment	Mesh Size (mm)	Area Sampled	Description of use
21.3-m Seine (center bag)	Bay	3.2	140 m ²	<ul style="list-style-type: none"> used in near-shore and shoreline areas ≤ 1.5 m
	River	3.2	68 m ²	<ul style="list-style-type: none"> used along river shorelines ≤ 1.8 m
183-m Haul Seine (center bag)	Boat	38.1	4,120 m ²	<ul style="list-style-type: none"> used along shorelines and exposed sandbars ≤ 2.5 m
6.1-m Otter Trawl	Straight Tow	38.1 (3.2-mm liner)	1,130 m ² - 2,259 m ²	<ul style="list-style-type: none"> used in areas from 1.8-m to 7.6-m deep
	Arc Tow	38.1 (3.2-mm liner)	1,130 m ² - 2,259 m ²	<ul style="list-style-type: none"> used in areas from 1.0-m to 1.7-m deep
Visual Surveys	Point Counts		5-m radius cylinder (79 m ²)	<ul style="list-style-type: none"> stationary diver censuses an area 10 m in diameter from bottom to surface

Table FIM07-02. Animals designated as Selected Taxa because of their commercial or recreational importance. In the Florida Keys, an additional listing of reef fish taxa is used for visual surveys (see Table FK07-01).

Scientific Name	Common Name
<i>Albula vulpes</i>	bonefish
<i>Alphestes afer</i>	mutton hamlet
<i>Archosargus probatocephalus</i>	sheepshead
<i>Callinectes sapidus</i>	blue crab
<i>Centropomus undecimalis</i>	common snook
<i>Cephalopholis cruentatus</i>	graysby
<i>Cynoscion arenarius</i>	sand seatrout
<i>Cynoscion nebulosus</i>	spotted seatrout
<i>Cynoscion nothus</i>	silver seatrout
<i>Cynoscion regalis</i>	weakfish
<i>Cynoscion complex</i>	seatrout
<i>Dermatolepis inermis</i>	marbled grouper
<i>Elops saurus</i>	ladyfish
<i>Epinephelus adscensionis</i>	rock hind
<i>Epinephelus drummondhayi</i>	speckled hind
<i>Epinephelus flavolimbatus</i>	yellowedge grouper
<i>Epinephelus fulvus</i>	coney
<i>Epinephelus guttatus</i>	red hind
<i>Epinephelus itajara</i>	goliath grouper
<i>Epinephelus morio</i>	red grouper
<i>Epinephelus mystacinus</i>	misty grouper
<i>Epinephelus nigritus</i>	Warsaw grouper
<i>Epinephelus niveatus</i>	snowy grouper
<i>Epinephelus striatus</i>	Nassau grouper
<i>Farfantepenaeus aztecus</i>	brown shrimp
<i>Farfantepenaeus brasiliensis</i>	pinkspotted shrimp
<i>Farfantepenaeus duorarum</i>	pink shrimp
<i>Farfantepenaeus spp.</i>	penaeid shrimps
<i>Leiostomus xanthurus</i>	spot
<i>Litopenaeus setiferus</i>	white shrimp
<i>Lutjanus analis</i>	mutton snapper
<i>Lutjanus apodus</i>	schoolmaster
<i>Lutjanus buccanella</i>	blackfin snapper
<i>Lutjanus campechanus</i>	red snapper
<i>Lutjanus cyanopterus</i>	cubera snapper

Table FIM07-02. (Continued)

Scientific Name	Common Name
<i>Lutjanus griseus</i>	gray snapper
<i>Lutjanus jocu</i>	dog snapper
<i>Lutjanus mahogoni</i>	mahogany snapper
<i>Lutjanus synagris</i>	lane snapper
<i>Lutjanus vivanus</i>	silk snapper
<i>Megalops atlanticus</i>	tarpon
<i>Menippe</i> spp.	stone crab
<i>Menticirrhus americanus</i>	southern kingfish
<i>Menticirrhus littoralis</i>	Gulf kingfish
<i>Menticirrhus saxatilis</i>	northern kingfish
<i>Micropogonias undulatus</i>	Atlantic croaker
<i>Mugil cephalus</i>	striped mullet
<i>Mugil curema</i>	white mullet
<i>Mugil gyrans</i>	whirligig mullet
<i>Mugil liza</i>	liza
<i>Mugil</i> sp. (redeye mullet)	redeye mullet
<i>Mycteroperca bonaci</i>	black grouper
<i>Mycteroperca microlepis</i>	gag
<i>Mycteroperca phenax</i>	scamp
<i>Mycteroperca tigris</i>	tiger grouper
<i>Mycteroperca venenosa</i>	yellowfin grouper
<i>Panulirus argus</i>	spiny lobster
<i>Paralichthys albigutta</i>	Gulf flounder
<i>Paralichthys dentatus</i>	summer flounder
<i>Paralichthys lethostigma</i>	southern flounder
<i>Paralichthys oblongus</i>	fourspot flounder
<i>Paralichthys squamilentus</i>	broad flounder
<i>Penaeidae</i> spp.	shrimps
<i>Pogonias cromis</i>	black drum
<i>Pomatomus saltatrix</i>	bluefish
<i>Rachycentron canadum</i>	cobia
<i>Sciaenops ocellatus</i>	red drum
<i>Scomberomorus cavalla</i>	king mackerel
<i>Scomberomorus maculatus</i>	Spanish mackerel
<i>Scomberomorus regalis</i>	cero
<i>Trachinotus carolinus</i>	pompano
<i>Trachinotus falcatus</i>	permit
<i>Trachinotus goodei</i>	palometa

Tampa Bay

Tampa Bay is a drowned river estuary located on the western, central coast of Florida. The bay is connected to the Gulf of Mexico through two main channels located on either side of Egmont Key and several smaller passes and channels to the north of Mullet and Long Keys and to the south of Anna Marie Island. Freshwater inflow into the bay comes from over 100 tributaries, although more than 80% enters from four main rivers (Alafia, Hillsborough, Manatee, and Little Manatee Rivers; Schmidt and Luther 2002). Shoreline vegetation consists largely of mangroves and marsh grasses, and bottom substrates are typically characterized as sand, mud, oysters, or a combination thereof (Flannery 1989). Seagrass meadows are the dominant vegetative cover in Tampa Bay and are widely distributed throughout the bay (Haddad 1989).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Tampa Bay since 1989. The area sampled was divided into five geographically-defined bay zones (A-E) and four riverine zones (K-N; Figure TB07-01). The riverine zones were defined by the Alafia (K), Little Manatee (L), Manatee (M), and Braden (N) rivers. Monthly stratified-random sampling (SRS) was conducted in Zones A-E using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zones K-N with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in Tampa Bay.

Stratified-Random Sampling

A total of 521,143 fishes (136 taxa) and selected invertebrates (11 taxa) were collected from 1,248 Tampa Bay SRS samples in 2007 (Table TB07-01, Appendices TB07-01, -02, and -03). *Anchoa mitchilli* (n=328,294) was the most numerous species collected, representing 63.0% of the total catch. *Lagodon rhomboides* (n=44,334) and *Menidia* spp. (n=21,236) were the next most abundant taxa collected, accounting for an additional 12.6% of the total catch. Twenty-eight Selected Taxa (n=23,245 animals) composed 4.5% of the total catch. *Mugil cephalus* (n=8,977) was the most abundant

Selected Taxon, representing 1.7% of the total catch. *Farfantepenaeus duorarum* (n=2,919) was the second most abundant Selected Taxon, comprising 0.6% of the total catch. Collections in 2007 included five species new to the Tampa Bay FIM collection: *Anchoa lyolepis* (dusky anchovy), *Chaetodon ocellatus* (spotfin butterflyfish), *Gerres cinereus* (yellow fin mojarra), *Mullus auratus* (red goatfish), and *Parablennius marmoratus* (seaweed blenny).

Bay Sampling

21.3-m Bay Seines. A total of 184,089 animals were collected in 408 21.3-m bay seines, representing 35.3% of the overall SRS catch (Table TB07-01). *Anchoa mitchilli* (n=117,385) was the most abundant taxon, accounting for 63.8% of the 21.3-m bay seine catch (Table TB07-02). The taxa most frequently caught in 21.3-m bay seines were *Lagodon rhomboides* (46.3% occurrence) and *Eucinostomus* spp. (42.2% occurrence).

A total of 2,991 animals from 22 Selected Taxa were collected, representing 1.6% of the entire 21.3-m bay seine catch (Table TB07-03). *Farfantepenaeus duorarum* (n=1,363) was the most abundant Selected Taxon, accounting for 45.6% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m bay seines was *F. duorarum* (25.0% occurrence).

183-m Haul Seines. A total of 56,822 animals were collected in 240 183-m haul seines, representing 10.9% of the overall SRS catch (Table TB07-01). *Lagodon rhomboides* (n=27,113) was the most abundant species, accounting for 47.7% of the 183-m haul seine catch (Table TB07-04). The species most frequently caught in 183-m haul seines were *L. rhomboides* (61.7% occurrence) and *M. cephalus* (60.0% occurrence).

A total of 6,583 animals from 28 Selected Taxa were collected, representing 11.6% of the entire 183-m haul seine catch (Table TB07-05). *Mugil cephalus* (n=1,065) was the most abundant Selected Taxon, accounting for 16.2% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 183-m haul seines was *M. cephalus* (60.0% occurrence).

6.1-m Bay Otter Trawls. A total of 10,816 animals were collected in 180 6.1-m bay otter trawls, representing 2.1% of the overall SRS catch (Table TB07-01). *Anchoa mitchilli* (n=1,555) and *Eucinostomus gula*. (n=1,482) were the most abundant taxa collected, accounting for 28.1% of the 6.1-m bay otter trawl catch (Table TB07-06). The taxon most frequently caught in 6.1-m bay otter trawls was *Prionotus scitulus* (67.8% occurrence).

A total of 1,623 animals from 17 Selected Taxa were collected, representing 15.0% of the entire 6.1-m bay otter trawl catch (Table TB07-07). *Callinectes sapidus* (n=494), *Cynoscion arenarius* (n=290), and *F. duorarum* (n=289) were the most abundant Selected Taxa, accounting for 66.1% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *C. sapidus* (38.3% occurrence) and *F. duorarum* (37.2% occurrence).

River Sampling

21.3-m River Seines. A total of 246,123 animals were collected in 264 21.3-m river seines, representing 47.2% of the overall SRS catch (Table TB07-01). *Anchoa mitchilli* (n=192,353) was the most abundant species collected, accounting for 78.2% of the 21.3-m river seine catch (Table TB07-08). The taxa most frequently caught in 21.3-m river seines were *Menidia* spp. (77.7% occurrence), *Eucinostomus harengulus* (76.1% occurrence), and *Eucinostomus* spp. (71.6% occurrence).

A total of 9,766 animals from 19 Selected Taxa were collected, representing 4.0% of the entire 21.3-m river seine catch (Table TB07-09). *Mugil cephalus* (n=7,648) was the most abundant Selected Taxon, accounting for 78.3% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *F. duorarum* (38.6% occurrence) and *C. sapidus* (31.1% occurrence).

6.1-m River Otter Trawls. A total of 23,294 animals were collected in 156 6.1-m river otter trawls, representing 4.5% of the overall SRS catch (Table TB07-01). *Anchoa mitchilli* (n=17,001) was the most abundant taxon collected, accounting for 73.0% of the 6.1-m river trawl catch (Table TB07-10). The taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (67.3% occurrence) and *F. duorarum* (51.9% occurrence).

A total of 2,283 animals from 14 Selected Taxa were collected, representing 9.8% of the entire 6.1-m river otter trawl catch (Table TB07-11). *Cynoscion arenarius* (n=794), *F. duorarum* (n=614), and *C. sapidus* (n=521) were the most abundant Selected Taxa, accounting for 84.5% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in the 6.1-m river otter trawls were *C. sapidus* (67.3% occurrence) and *F. duorarum* (51.9% occurrence).

References

- Flannery, M. 1989. Tampa and Sarasota Bays: Watersheds and Tributaries. Pp 18-48
In: E.D. Estevez, (ed.), Tampa and Sarasota Bays: Issues, Resources, Status,
and Management. U.S. Department of Commerce. Washington, D.C.
- Haddad, K. 1989. Habitat Trends and Fisheries in Tampa and Sarasota Bays. Pp 113-
128 In: E.D. Estevez, (ed.), Tampa and Sarasota Bays: Issues, Resources,
Status, and Management. U.S. Department of Commerce. Washington, D.C.
- Schmidt, N. and M.E. Luther. 2002. ENSO Impacts on Salinity in Tampa Bay, Florida.
Estuaries 25:976–984.

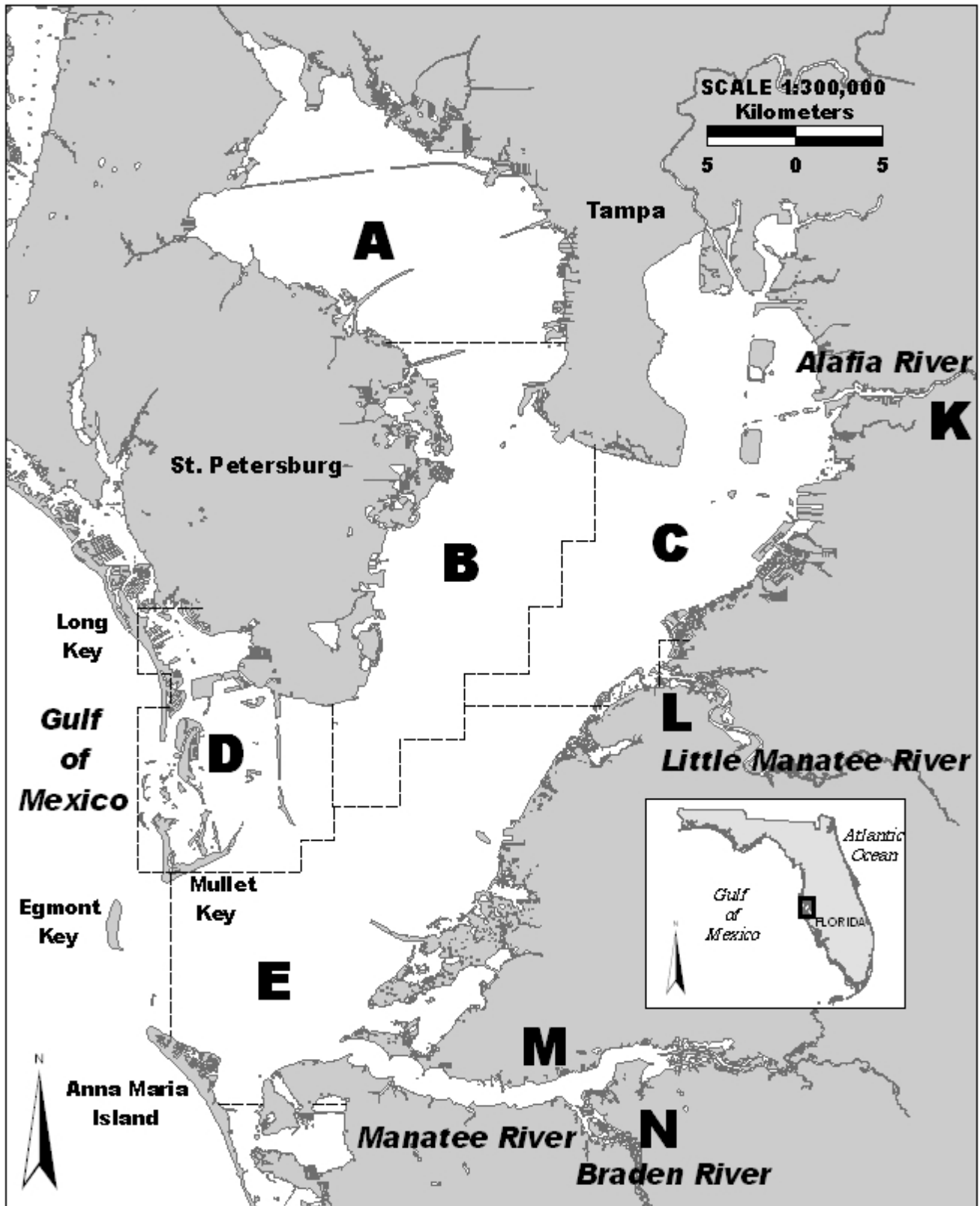


Figure TB07-01. Map of Tampa Bay sampling area. Zones are labeled A-E and K-N.

Table TB07-01. Summary of catch and effort data for Tampa Bay stratified-random sampling, 2007.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	81,136	84	.	.	6,805	48	1,569	36	89,510	168
B	21,931	72	.	.	10,818	48	1,574	36	34,323	156
C	22,347	108	.	.	4,637	48	3,175	48	30,159	204
D	23,891	60	.	.	20,182	36	2,709	24	46,782	120
E	34,784	84	.	.	14,380	60	1,789	36	50,953	180
K	.	.	100,220	48	.	.	8,026	24	108,246	72
L	.	.	60,606	96	.	.	12,299	72	72,905	168
M	.	.	51,922	72	.	.	565	36	52,487	108
N	.	.	33,375	48	.	.	2,403	24	35,778	72
Totals	184,089	408	246,123	264	56,822	240	34,109	336	521,143	1,248

Table TB07-02. Catch statistics for 10 dominant taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	117,385	63.8	19.4	205.51	113.46	1,115.17	44,814.29	30	0.01	14	59
<i>Lagodon rhomboides</i>	11,538	6.3	46.3	20.20	3.24	324.06	634.29	40	0.16	11	187
<i>Harengula jaguana</i>	9,443	5.1	18.1	16.53	4.37	533.60	1,057.86	52	0.11	19	90
<i>Lucania parva</i>	8,311	4.5	21.8	14.55	3.72	517.08	793.57	25	0.06	11	44
<i>Eucinostomus</i> spp.	7,795	4.2	42.2	13.65	1.97	291.20	416.43	28	0.08	11	40
<i>Menidia</i> spp.	6,878	3.7	27.5	12.04	2.24	375.52	458.57	44	0.15	13	96
<i>Floridichthys carpio</i>	4,387	2.4	19.9	7.68	1.70	448.29	360.71	32	0.17	9	65
<i>Cyprinodon variegatus</i>	2,622	1.4	9.1	4.59	2.13	935.50	660.71	26	0.22	11	61
<i>Eucinostomus gula</i>	2,487	1.4	34.3	4.35	0.68	313.15	152.14	55	0.21	40	99
<i>Sardinella aurita</i>	1,634	0.9	1.7	2.86	1.96	1,384.06	570.71	61	0.09	36	84
Subtotal	172,480	93.7	.	.	.	.	.	.	.	9	187
Totals	184,089	100.0	.	322.28	113.68	712.51	44,815.00	.	.	3	695

Table TB07-03. Catch statistics for Selected Taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus duorarum</i>	1,363	0.7	25.0	2.39	0.49	411.91	79.29	10	0.11	3	41
<i>Leiostomus xanthurus</i>	393	0.2	6.9	0.69	0.30	895.20	98.57	35	0.74	10	112
<i>Callinectes sapidus</i>	336	0.2	19.9	0.59	0.25	869.56	100.71	28	1.34	6	165
<i>Cynoscion nebulosus</i>	273	0.1	17.9	0.48	0.08	326.99	12.86	40	1.31	16	150
<i>Mugil cephalus</i>	264	0.1	3.4	0.46	0.41	1,799.97	167.86	29	0.28	21	48
<i>Sciaenops ocellatus</i>	81	0.0	2.9	0.14	0.08	1,203.88	32.86	53	4.32	13	333
<i>Archosargus probatocephalus</i>	54	0.0	4.7	0.09	0.04	890.10	15.71	56	9.11	14	284
<i>Mugil gyrans</i>	48	0.0	1.7	0.08	0.05	1,149.51	13.57	34	5.50	15	235
<i>Lutjanus griseus</i>	44	0.0	5.1	0.08	0.02	608.48	7.14	57	6.65	15	179
<i>Menticirrhus americanus</i>	39	0.0	2.9	0.07	0.02	713.41	5.71	31	1.49	15	55
<i>Menticirrhus saxatilis</i>	17	0.0	2.0	0.03	0.01	843.65	3.57	24	1.98	14	40
<i>Paralichthys albigutta</i>	14	0.0	2.7	0.02	0.01	670.12	2.14	47	9.02	15	120
<i>Mugil curema</i>	12	0.0	1.0	0.02	0.01	1,406.48	5.71	58	10.29	25	154
<i>Centropomus undecimalis</i>	11	0.0	0.7	0.02	0.02	1,671.98	6.43	99	32.58	40	423
<i>Pomatomus saltatrix</i>	10	0.0	0.7	0.02	0.01	1,367.99	4.29	81	4.25	54	100
<i>Mycteroperca microlepis</i>	9	0.0	1.2	0.02	0.01	1,205.95	3.57	184	10.20	149	225
<i>Cynoscion arenarius</i>	6	0.0	1.2	0.01	0.00	948.09	1.43	20	2.82	11	27

Table TB07-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lutjanus synagris</i>	5	0.0	0.7	0.01	0.01	1,337.75	2.14	42	5.69	21	52
<i>Elops saurus</i>	4	0.0	1.0	0.01	0.00	1,006.22	0.71	190	54.08	39	289
<i>Trachinotus falcatus</i>	4	0.0	0.7	0.01	0.00	1,234.40	1.43	44	12.57	18	78
<i>Menticirrhus littoralis</i>	3	0.0	0.2	0.01	0.01	2,019.90	2.14	60	10.02	49	80
<i>Rachycentron canadum</i>	1	0.0	0.2	0.00	0.00	2,019.90	0.71	.	.	.	.
Totals	2,991	1.6	54.9	5.24	0.84	322.38	171.43	.	.	3	423

Table TB07-04. Catch statistics for 10 dominant taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	27,113	47.7	61.7	112.97	17.93	245.83	2,074.00	95	0.13	23	197
<i>Eucinostomus gula</i>	6,278	11.0	47.5	26.16	8.82	522.24	1,702.00	87	0.14	45	141
<i>Eucinostomus harengulus</i>	5,736	10.1	45.4	23.90	6.08	394.38	939.00	95	0.12	53	128
<i>Harengula jaguana</i>	2,350	4.1	10.4	9.79	7.12	1,125.79	1,674.00	111	0.25	44	132
<i>Ariopsis felis</i>	2,197	3.9	29.2	9.15	3.94	666.04	885.00	280	0.89	153	388
<i>Orthopristis chrysoptera</i>	1,454	2.6	15.8	6.06	3.67	937.59	870.00	104	0.39	74	194
<i>Brevoortia</i> spp.	1,224	2.2	3.8	5.10	4.99	1,516.22	1,198.00	95	0.15	82	159
<i>Mugil cephalus</i>	1,065	1.9	60.0	4.44	0.65	227.09	88.00	242	2.85	71	460
<i>Centropomus undecimalis</i>	975	1.7	44.2	4.06	0.81	307.10	137.00	453	3.80	133	908
<i>Bairdiella chrysoura</i>	954	1.7	8.8	3.98	2.62	1,020.40	609.00	115	0.38	56	170
Subtotal	49,346	86.9	.	.	.	.	.	.	.	23	908
Totals	56,822	100.0	.	236.76	27.00	176.67	2,348.00	.	.	12	1088

Table TB07-05. Catch statistics for Selected Taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Mugil cephalus</i>	1,065	1.9	60.0	4.44	0.65	227.09	88.00	242	2.85	71	460
<i>Centropomus undecimalis</i>	975	1.7	44.2	4.06	0.81	307.10	137.00	453	3.80	133	908
<i>Elops saurus</i>	902	1.6	37.1	3.76	0.87	359.73	146.00	293	2.20	156	588
<i>Mugil curema</i>	866	1.5	37.1	3.61	0.75	323.20	117.00	162	1.48	100	310
<i>Leiostomus xanthurus</i>	576	1.0	12.9	2.40	0.78	505.92	117.00	111	1.24	62	196
<i>Archosargus probatocephalus</i>	461	0.8	33.8	1.92	0.42	336.24	75.00	222	3.53	59	411
<i>Lutjanus griseus</i>	439	0.8	14.6	1.83	0.75	631.46	153.00	145	1.33	42	302
<i>Mugil gyrans</i>	377	0.7	29.2	1.57	0.27	267.65	30.00	162	2.25	102	276
<i>Callinectes sapidus</i>	335	0.6	30.8	1.40	0.26	283.23	39.00	99	1.91	24	251
<i>Sciaenops ocellatus</i>	150	0.3	23.8	0.63	0.12	302.85	18.00	411	9.52	76	685
<i>Cynoscion nebulosus</i>	98	0.2	14.6	0.41	0.09	357.74	13.00	188	7.07	65	404
<i>Mycteroperca microlepis</i>	92	0.2	6.3	0.38	0.15	618.79	26.00	171	4.28	100	345
<i>Trachinotus falcatus</i>	49	0.1	5.8	0.20	0.08	590.17	12.00	152	11.35	56	425
<i>Menticirrhus saxatilis</i>	44	0.1	0.4	0.18	0.18	1,549.19	44.00	215	3.77	163	261
<i>Farfantepenaeus duorarum</i>	36	0.1	7.9	0.15	0.04	396.64	4.00	22	0.69	12	30
<i>Paralichthys albigutta</i>	34	0.1	8.3	0.14	0.04	490.04	9.00	131	11.93	66	325
<i>Trachinotus carolinus</i>	26	0.0	2.1	0.11	0.07	934.94	14.00	122	18.98	47	373

Table TB07-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Menticirrhus americanus</i>	22	0.0	2.5	0.09	0.05	792.04	8.00	208	5.20	169	253
<i>Scomberomorus maculatus</i>	11	0.0	1.7	0.05	0.03	962.34	6.00	318	27.60	231	558
<i>Lutjanus synagris</i>	10	0.0	1.7	0.04	0.02	844.38	4.00	127	12.07	89	193
<i>Pogonias cromis</i>	4	0.0	1.7	0.02	0.01	769.72	1.00	232	65.87	150	428
<i>Menippe</i> spp.	3	0.0	0.8	0.01	0.01	1,152.77	2.00	73	2.85	67	76
<i>Pomatomus saltatrix</i>	2	0.0	0.8	0.01	0.01	1,093.15	1.00	147	26.50	120	173
<i>Epinephelus itajara</i>	2	0.0	0.4	0.01	0.01	1,549.19	2.00	185	50.00	135	235
<i>Megalops atlanticus</i>	1	0.0	0.4	0.00	0.00	1,549.19	1.00	610	.	610	610
<i>Rachycentron canadum</i>	1	0.0	0.4	0.00	0.00	1,549.19	1.00	545	.	545	545
<i>Cynoscion arenarius</i>	1	0.0	0.4	0.00	0.00	1,549.19	1.00	194	.	194	194
<i>Menticirrhus littoralis</i>	1	0.0	0.4	0.00	0.00	1,549.19	1.00	241	.	241	241
Totals	6,583	11.6	96.3	27.43	2.30	129.95	237.00	.	.	12	908

Table TB07-06. Catch statistics for 10 dominant taxa collected in 180 bay 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	1,555	14.4	11.1	0.58	0.37	846.93	63.48	37	0.13	25	57
<i>Eucinostomus gula</i>	1,482	13.7	35.0	0.56	0.14	327.24	13.85	82	0.33	41	130
<i>Lagodon rhomboides</i>	1,093	10.1	37.8	0.42	0.10	307.73	10.23	83	0.90	13	138
<i>Prionotus scitulus</i>	1,082	10.0	67.8	0.41	0.07	241.79	8.70	96	0.90	13	166
<i>Portunus</i> spp.	910	8.4	47.2	0.35	0.11	432.46	16.26	41	0.46	5	84
<i>Callinectes sapidus</i>	494	4.6	38.3	0.22	0.07	398.24	10.79	84	1.74	10	191
<i>Orthopristis chrysoptera</i>	346	3.2	19.4	0.13	0.06	630.44	10.15	100	1.24	15	160
<i>Eucinostomus</i> spp.	344	3.2	15.0	0.12	0.06	626.82	8.95	26	0.39	11	39
<i>Cynoscion arenarius</i>	290	2.7	15.0	0.12	0.04	462.12	3.98	31	2.00	10	237
<i>Farfantepenaeus duorarum</i>	289	2.7	37.2	0.11	0.02	236.88	1.62	21	0.54	4	45
Subtotal	7,885	73.0	.	.	.	.	.	.	.	4	237
Totals	10,816	100.0	.	4.16	0.50	162.18	65.91	.	.	3	935

Table TB07-07. Catch statistics for Selected Taxa collected in 180 bay 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Callinectes sapidus</i>	494	4.6	38.3	0.22	0.07	398.24	10.79	84	1.74	10	191
<i>Cynoscion arenarius</i>	290	2.7	15.0	0.12	0.04	462.12	3.98	31	2.00	10	237
<i>Farfantepenaeus duorarum</i>	289	2.7	37.2	0.11	0.02	236.88	1.62	21	0.54	4	45
<i>Menippe</i> spp.	234	2.2	26.1	0.09	0.02	294.89	2.40	23	1.01	3	104
<i>Menticirrhus americanus</i>	130	1.2	21.7	0.05	0.01	291.78	0.94	78	6.21	13	278
<i>Paralichthys albigutta</i>	67	0.6	18.3	0.03	0.01	320.70	0.82	154	5.17	78	246
<i>Leiostomus xanthurus</i>	56	0.5	2.8	0.02	0.01	715.27	1.55	126	3.04	83	164
<i>Lutjanus synagris</i>	24	0.2	8.3	0.01	0.00	389.26	0.27	83	7.96	17	140
<i>Cynoscion nebulosus</i>	14	0.1	3.3	0.01	0.00	806.77	0.54	56	15.63	14	174
<i>Archosargus probatocephalus</i>	10	0.1	2.8	0.00	0.00	747.72	0.34	124	14.91	31	194
<i>Lutjanus griseus</i>	6	0.1	1.7	0.00	0.00	836.91	0.20	105	20.46	26	163
<i>Mycteroperca microlepis</i>	2	0.0	1.1	0.00	0.00	946.34	0.07	84	64.50	19	148
<i>Menticirrhus saxatilis</i>	2	0.0	1.1	0.00	0.00	947.22	0.07	125	94.50	30	219
<i>Pogonias cromis</i>	2	0.0	0.6	0.00	0.00	1,341.64	0.13	210	0.00	210	210
<i>Elops saurus</i>	1	0.0	0.6	0.00	0.00	1,341.64	0.07	19	.	19	19
<i>Epinephelus itajara</i>	1	0.0	0.6	0.00	0.00	1,341.64	0.07	263	.	263	263
<i>Rachycentron canadum</i>	1	0.0	0.6	0.00	0.00	1,341.64	0.07	440	.	440	440
Totals	1,623	15.0	83.9	0.66	0.09	173.41	11.20	.	.	3	440

Table TB07-08. Catch statistics for 10 dominant taxa collected in 264 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	192,353	78.2	59.1	1,071.49	331.42	502.56	82,826.47	28	0.01	16	67
<i>Menidia</i> spp.	14,344	5.8	77.7	79.90	13.29	270.20	2,442.65	37	0.08	12	88
<i>Mugil cephalus</i>	7,648	3.1	12.5	42.60	39.88	1,520.88	10,527.94	25	0.09	19	382
<i>Eucinostomus</i> spp.	7,441	3.0	71.6	41.45	5.18	203.02	763.24	28	0.07	8	39
<i>Eucinostomus harengulus</i>	4,538	1.8	76.1	25.28	2.38	153.10	280.88	62	0.20	40	114
<i>Lagodon rhomboides</i>	4,183	1.7	55.3	23.30	7.98	556.43	2,016.18	42	0.24	13	146
<i>Lucania parva</i>	2,643	1.1	34.8	14.72	5.58	615.70	1,313.24	23	0.13	7	45
<i>Eucinostomus gula</i>	1,648	0.7	37.9	9.18	1.96	346.16	350.00	62	0.31	40	95
<i>Harengula jaguana</i>	1,202	0.5	7.2	6.70	4.42	1,071.62	1,132.35	37	0.42	22	89
<i>Microgobius gulosus</i>	994	0.4	43.6	5.54	0.90	265.36	132.35	28	0.21	14	54
Subtotal	236,994	96.3	.	.	.	.	.	.	.	7	382
Totals	246,123	100.0	.	1,371.01	335.22	397.28	83,350.00	.	.	2	625

Table TB07-09. Catch statistics for Selected Taxa collected in 264 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Mugil cephalus</i>	7,648	3.1	12.5	42.60	39.88	1,520.88	10,527.94	25	0.09	19	382
<i>Farfantepenaeus duorarum</i>	617	0.3	38.6	3.44	0.58	275.34	88.24	8	0.14	2	27
<i>Callinectes sapidus</i>	490	0.2	31.1	2.73	0.88	524.96	188.24	26	1.01	5	150
<i>Leiostomus xanthurus</i>	273	0.1	16.7	1.52	0.40	432.25	79.41	58	1.73	12	168
<i>Centropomus undecimalis</i>	192	0.1	22.7	1.07	0.31	476.34	75.00	139	7.01	17	438
<i>Sciaenops ocellatus</i>	148	0.1	15.9	0.82	0.18	362.31	32.35	62	8.01	11	625
<i>Archosargus probatocephalus</i>	126	0.1	19.7	0.70	0.14	331.88	27.94	65	5.18	17	317
<i>Cynoscion nebulosus</i>	111	0.0	14.4	0.62	0.13	338.37	19.12	48	2.06	19	129
<i>Mugil curema</i>	61	0.0	6.4	0.34	0.12	580.34	25.00	85	7.31	22	300
<i>Lutjanus griseus</i>	28	0.0	9.1	0.16	0.03	344.10	4.41	89	10.15	15	208
<i>Elops saurus</i>	22	0.0	1.9	0.12	0.08	1,020.40	19.12	53	11.50	18	183
<i>Cynoscion arenarius</i>	15	0.0	1.5	0.08	0.05	1,053.03	13.24	32	4.18	19	71
<i>Pomatomus saltatrix</i>	11	0.0	0.4	0.06	0.06	1,624.81	16.18	63	1.84	52	74
<i>Mugil gyrans</i>	10	0.0	2.7	0.06	0.02	683.35	4.41	51	11.16	15	118
<i>Menticirrhus americanus</i>	5	0.0	1.5	0.03	0.01	855.55	2.94	34	5.89	16	47
<i>Pogonias cromis</i>	4	0.0	0.4	0.02	0.02	1,624.81	5.88	18	0.63	16	19
<i>Menticirrhus saxatilis</i>	2	0.0	0.8	0.01	0.01	1,146.73	1.47	51	10.50	40	61
<i>Paralichthys albigutta</i>	2	0.0	0.8	0.01	0.01	1,146.73	1.47	76	19.00	57	95
<i>Menippe</i> spp.	1	0.0	0.4	0.01	0.01	1,624.81	1.47	48	.	48	48
Totals	9,766	4.0	88.3	54.40	39.90	1,191.59	10,539.71	.	.	2	625

Table TB07-10. Catch statistics for 10 dominant taxa collected in 156 river 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	17,001	73.0	32.1	15.04	3.82	316.79	335.19	27	0.06	14	60
<i>Eucinostomus</i> spp.	1,378	5.9	34.0	1.26	0.41	410.17	46.47	24	0.17	10	39
<i>Cynoscion arenarius</i>	794	3.4	15.4	0.70	0.32	573.95	38.45	33	0.53	13	252
<i>Farfantepenaeus duorarum</i>	614	2.6	51.9	0.55	0.11	241.56	12.74	12	0.26	2	40
<i>Trinectes maculatus</i>	597	2.6	34.6	0.52	0.14	328.17	12.82	31	0.53	9	85
<i>Callinectes sapidus</i>	521	2.2	67.3	0.48	0.08	202.97	8.26	97	1.92	6	200
<i>Lagodon rhomboides</i>	407	1.7	24.4	0.38	0.22	705.57	33.13	29	1.08	12	117
<i>Microgobius gulosus</i>	296	1.3	30.1	0.26	0.07	314.99	6.15	25	0.44	12	53
<i>Eucinostomus gula</i>	184	0.8	14.7	0.17	0.06	472.18	8.24	70	0.93	40	110
<i>Menticirrhus americanus</i>	181	0.8	19.9	0.16	0.07	534.69	9.58	38	2.33	13	260
Subtotal	21,973	94.3	.	.	.	.	.	.	.	2	260
Totals	23,294	100.0	.	20.69	4.01	242.07	340.14	.	.	2	776

Table TB07-11. Catch statistics for Selected Taxa collected in 156 river 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Cynoscion arenarius</i>	794	3.4	15.4	0.70	0.32	573.95	38.45	33	0.53	13	252
<i>Farfantepenaeus duorarum</i>	614	2.6	51.9	0.55	0.11	241.56	12.74	12	0.26	2	40
<i>Callinectes sapidus</i>	521	2.2	67.3	0.48	0.08	202.97	8.26	97	1.92	6	200
<i>Menticirrhus americanus</i>	181	0.8	19.9	0.16	0.07	534.69	9.58	38	2.33	13	260
<i>Cynoscion nebulosus</i>	62	0.3	8.3	0.06	0.04	786.09	5.40	32	2.27	16	150
<i>Archosargus probatocephalus</i>	60	0.3	15.4	0.05	0.01	353.94	1.35	123	5.97	22	214
<i>Leiostomus xanthurus</i>	21	0.1	3.8	0.02	0.01	834.20	1.72	54	9.89	14	140
<i>Lutjanus griseus</i>	8	0.0	3.8	0.01	0.00	570.94	0.40	127	13.27	65	176
<i>Paralichthys albigutta</i>	8	0.0	3.2	0.01	0.00	580.40	0.30	156	34.42	56	370
<i>Sciaenops ocellatus</i>	6	0.0	3.2	0.01	0.00	579.14	0.27	145	79.99	11	460
<i>Menippe</i> spp.	3	0.0	0.6	0.00	0.00	1,249.00	0.40	43	1.45	40	45
<i>Elops saurus</i>	2	0.0	1.3	0.00	0.00	880.32	0.15	247	12.50	234	259
<i>Pogonias cromis</i>	2	0.0	0.6	0.00	0.00	1,249.00	0.30	310	18.50	291	328
<i>Lutjanus synagris</i>	1	0.0	0.6	0.00	0.00	1,249.00	0.13	60	.	60	60
Totals	2,283	9.8	86.5	2.04	0.42	255.61	50.19	.	.	2	460

Appendix TB07-01. Monthly summary of species collected during Tampa Bay stratified-random sampling, 2007. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104		E=1,248
<i>Acanthostracion quadricornis</i>	30	4	55	31	3	20	9	22	16	38	5	11	244
<i>Achirus lineatus</i>	21	6	5	10	7	12	24	87	22	27	14	20	255
<i>Adinia xenica</i>	39	1	41	.	.	.	.	.	2	1	.	4	88
<i>Aetobatus narinari</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Aluterus schoepfii</i>	.	.	1	.	.	4	.	5	.	3	.	5	18
<i>Anarchopterus criniger</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Anchoa cubana</i>	.	.	.	.	.	3	.	.	.	3	32	.	38
<i>Anchoa hepsetus</i>	.	.	.	.	89	63	1	132	.	13	2	.	300
<i>Anchoa lyolepis</i>	.	.	.	.	.	2	.	.	.	.	.	.	2
<i>Anchoa mitchilli</i>	14,842	3,489	1,924	22,742	20,682	14,529	82,438	6,284	28,802	16,973	95,984	19,605	328,294
<i>Ancylopsetta quadrocellata</i>	.	.	.	.	1	1	.	.	.	1	.	.	3
<i>Archosargus probatocephalus</i>	54	39	50	60	77	96	62	111	59	41	33	29	711
<i>Argopecten</i> spp.	.	.	1	1	10	.	1	1	.	.	1	12	27
<i>Ariopsis felis</i>	59	117	47	132	59	266	425	109	174	158	69	934	2,549
<i>Bagre marinus</i>	3	13	3	4	.	16	12	2	4	37	13	.	107
<i>Bairdiella chrysoura</i>	112	613	86	7	48	179	373	715	284	56	37	104	2,614
<i>Bathygobius soporator</i>	10	13	8	9	4	3	3	2	5	18	8	16	99
<i>Belonesox belizanus</i>	1	1	1	1	.	.	.	1	.	.	1	1	7
<i>Brevoortia</i> spp.	.	.	2	19	49	100	170	75	1,198	1	6	.	1,620
<i>Calamus arctifrons</i>	8	2	1	2	.	1	.	1	1	3	.	.	19
<i>Callinectes ornatus</i>	.	.	.	.	.	3	4	1	.	.	.	.	8
<i>Callinectes sapidus</i>	181	213	281	257	149	239	262	96	66	222	98	112	2,176
<i>Callinectes similis</i>	.	.	7	.	.	4	.	.	.	.	2	.	13
<i>Caranx crysos</i>	.	.	.	.	.	.	.	.	1	.	.	.	1

Appendix TB07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=1,248
<i>Caranx hippos</i>	.	1	.	.	1	2	1	5	130	.	2	11	153
<i>Caranx latus</i>	.	.	.	.	.	.	.	.	.	3	1	.	4
<i>Carcharhinus acronotus</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Carcharhinus leucas</i>	.	.	.	.	.	1	1	.	.	.	.	.	2
<i>Centropomus undecimalis</i>	191	77	45	40	36	97	329	87	53	101	86	36	1,178
<i>Centropristis striata</i>	.	.	1	1	1	.	.	2	1	3	2	7	18
<i>Chaetodipterus faber</i>	16	.	50	32	5	24	28	28	27	44	2	.	256
<i>Chaetodon ocellatus</i>	.	.	.	.	.	.	.	2	.	.	.	.	2
<i>Chasmodes saburrae</i>	17	.	4	11	4	7	7	21	4	2	4	7	88
<i>Chilomycterus schoepfii</i>	12	25	34	42	21	19	18	27	15	18	39	44	314
<i>Chloroscombrus chrysurus</i>	1	.	.	.	.	.	25	8	19	21	2	2	78
<i>Citharichthys macrops</i>	.	2	.	.	1	.	.	1	.	.	.	.	4
<i>Ctenogobius smaragdus</i>	3	.	.	.	.	.	.	1	.	.	.	.	4
<i>Cynoscion arenarius</i>	6	4	.	1	24	18	299	64	599	67	17	7	1,106
<i>Cynoscion nebulosus</i>	21	22	16	6	17	42	89	95	107	98	26	19	558
<i>Cyprinodon variegatus</i>	672	152	21	542	1,001	128	22	20	24	27	207	47	2,863
<i>Dactyloscopus moorei</i>	.	3	.	.	.	.	.	.	.	.	.	.	3
<i>Dasyatis sabina</i>	52	22	37	36	27	37	18	39	35	30	44	19	396
<i>Dasyatis say</i>	2	4	.	.	1	9	4	6	11	3	1	.	41
<i>Diplectrum formosum</i>	1	2	5	4	11	3	.	9	.	3	.	.	38
<i>Diplodus holbrookii</i>	.	.	.	.	2	4	6	76	13	34	.	13	148
<i>Dorosoma petenense</i>	.	.	.	.	.	.	.	.	4	.	.	8	12
<i>Echeneis spp.</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Elacatinus macrodon</i>	.	.	.	.	.	.	.	.	.	5	.	.	5
<i>Elops saurus</i>	64	88	15	124	5	58	37	41	89	72	294	44	931
<i>Epinephelus itajara</i>	.	.	.	.	.	2	.	.	.	.	.	1	3

Appendix TB07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	
<i>Eucinostomus gula</i>	3,751	1,381	358	370	396	1,392	223	449	729	786	1,081	1,163	12,079
<i>Eucinostomus harengulus</i>	2,340	610	859	802	1,230	1,590	559	1,234	1,011	824	417	479	11,955
<i>Eucinostomus</i> spp.	214	711	673	670	76	480	1,861	2,081	2,133	1,474	3,459	3,127	16,959
<i>Eugerres plumieri</i>	51	3	20	1	4	5	166	215	72	43	27	13	620
<i>Farfantepenaeus duorarum</i>	115	45	52	43	41	55	178	516	504	841	306	223	2,919
<i>Floridichthys carpio</i>	629	907	33	376	245	324	313	249	48	509	1,004	522	5,159
<i>Fundulus grandis</i>	75	36	114	17	12	81	2	17	32	55	155	171	767
<i>Fundulus seminolis</i>	.	2	.	.	.	.	.	2	.	.	.	.	4
<i>Fundulus similis</i>	146	50	29	205	223	191	36	32	108	135	404	133	1,692
<i>Gambusia holbrooki</i>	1	3	8	.	4	31	2	2	10	144	7	3	215
<i>Gerres cinereus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Gobiesox strumosus</i>	1	1	3	2	3	1	7	8	1	2	1	5	35
<i>Gobionellus oceanicus</i>	.	.	.	.	1	.	.	.	.	.	.	.	1
<i>Gobiosoma bosc</i>	17	38	50	13	18	13	37	42	41	41	27	23	360
<i>Gobiosoma longipala</i>	4	5	8	1	1	1	.	1	1	.	.	1	23
<i>Gobiosoma robustum</i>	19	38	93	50	12	6	13	19	19	14	28	27	338
<i>Gobiosoma</i> spp.	13	7	19	7	5	33	44	63	73	25	37	21	347
<i>Gymnura micrura</i>	2	1	14	3	1	4	4	3	3	1	3	.	39
<i>Haemulon plumierii</i>	1	.	.	.	.	.	1	.	.	6	2	.	10
<i>Halichoeres bivittatus</i>	.	.	.	.	.	.	4	.	1	.	.	.	5
<i>Harengula jaguana</i>	492	294	55	535	11	18	3,344	727	4,187	2,655	376	333	13,027
<i>Heterandria formosa</i>	.	2	.	.	.	.	.	.	.	.	.	.	2
<i>Hippocampus erectus</i>	16	17	13	13	15	9	7	7	1	2	1	3	104
<i>Hippocampus zosterae</i>	.	4	1	1	.	.	2	.	.	1	5	5	19
<i>Hypleurochilus caudovittatus</i>	.	.	.	.	.	1	2	3	.	.	.	.	6
<i>Hyporhamphus meeki</i>	.	5	1	1	.	.	8	4	1	6	1	.	27

Appendix TB07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104		E=1,248
<i>Hyporhamphus</i> spp.	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Hyporhamphus unifasciatus</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Hypsoblennius hentz</i>	1	.	.	.	.	2	.	.	.	.	.	.	3
<i>Lactophrys trigonus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Lagodon rhomboides</i>	2,889	2,031	2,198	5,440	3,505	4,835	2,486	5,000	2,822	4,538	6,401	2,189	44,334
<i>Leiostomus xanthurus</i>	102	113	218	239	156	285	109	58	11	19	.	9	1,319
<i>Lepisosteus osseus</i>	3	2	1	1	2	.	.	.	.	2	1	.	12
<i>Lepisosteus platyrhincus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Limulus polyphemus</i>	3	8	3	15	5	2	2	1	2	2	2	12	57
<i>Lucania parva</i>	225	870	284	1,518	1,870	1,701	893	1,308	235	1,098	580	432	11,014
<i>Lutjanus griseus</i>	4	2	3	.	6	41	20	240	84	107	11	7	525
<i>Lutjanus synagris</i>	2	1	1	1	.	3	2	6	4	8	7	5	40
<i>Malaclemys terrapin</i>	.	.	.	.	1	.	.	.	.	.	.	.	1
<i>Megalops atlanticus</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Membras martinica</i>	.	.	.	.	.	21	60	.	18	4	.	.	103
<i>Menidia</i> spp.	819	548	664	1,816	3,264	3,642	1,129	3,512	2,176	1,871	1,158	637	21,236
<i>Menippe</i> spp.	10	19	10	42	14	30	11	24	26	22	18	15	241
<i>Menticirrhus americanus</i>	28	6	1	.	18	19	27	38	119	64	42	15	377
<i>Menticirrhus littoralis</i>	.	.	.	.	.	3	.	1	.	.	.	.	4
<i>Menticirrhus saxatilis</i>	4	7	1	3	1	4	.	.	44	.	1	.	65
<i>Microgobius gulosus</i>	56	138	125	57	87	276	526	526	307	264	287	77	2,726
<i>Microgobius thalassinus</i>	2	.	4	4	1	.	22	11	4	13	5	2	68
<i>Monacanthus ciliatus</i>	5	.	1	.	.	.	.	.	1	2	1	1	11
<i>Mugil cephalus</i>	124	503	7,504	319	144	115	59	38	12	42	76	41	8,977
<i>Mugil curema</i>	90	26	60	58	21	17	22	38	64	179	202	162	939
<i>Mugil gyrans</i>	28	58	19	37	24	7	42	5	13	74	73	55	435

Appendix TB07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=1,248
<i>Mugil</i> spp.	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Mullus auratus</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Mycteroperca microlepis</i>	.	.	.	.	1	5	6	33	13	23	20	2	103
<i>Myrophis punctatus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Nicholsina usta</i>	1	.	5	3	1	15	7	1	10	29	10	6	88
<i>Notemigonus crysoleucas</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Oligoplites saurus</i>	.	8	.	3	.	10	164	85	54	70	23	1	418
<i>Opisthonema oglinum</i>	4	.	.	8	5	6	167	358	49	147	29	.	773
<i>Opsanus beta</i>	24	5	14	21	11	47	9	28	10	15	4	20	208
<i>Orthopristis chrysoptera</i>	193	7	5	55	348	221	66	1,082	49	103	149	80	2,358
<i>Parablennius marmoratus</i>	.	.	.	.	1	.	.	.	.	.	.	.	1
<i>Paralichthys albigutta</i>	1	6	8	10	17	14	13	25	14	8	5	4	125
<i>Peprilus paru</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Poecilia latipinna</i>	30	138	59	12	1	33	.	32	34	396	26	61	822
<i>Pogonias cromis</i>	2	.	4	1	.	.	.	.	.	2	3	.	12
<i>Pomatomus saltatrix</i>	3	.	.	.	.	18	1	.	1	.	.	.	23
<i>Portunus</i> spp.	33	11	9	39	151	50	213	312	65	15	15	22	935
<i>Prionotus scitululus</i>	84	67	84	26	69	96	82	59	230	191	63	84	1,135
<i>Prionotus tribulus</i>	40	15	20	7	10	2	3	.	3	2	19	13	134
<i>Rachycentron canadum</i>	.	.	.	.	.	.	.	1	1	1	.	.	3
<i>Rhinobatos lentiginosus</i>	.	.	1	1	.	.	1	.	2	1	.	.	6
<i>Rhinoptera bonasus</i>	3	21	17	28	94	55	51	4	14	21	57	1	366
<i>Rimapenaeus constrictus</i>	.	7	.	.	.	.	1	.	.	8	1	.	17
<i>Sardinella aurita</i>	.	.	.	.	1	.	1,630	4	.	.	.	.	1,635
<i>Sarotherodon melanotheron</i>	43	.	.	.	.	.	.	3	4	1	1	11	63
<i>Sciaenops ocellatus</i>	142	33	37	20	17	14	6	7	4	19	60	26	385

Appendix TB07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104	E=104		E=1,248
<i>Scomberomorus maculatus</i>	.	.	.	.	.	.	3	.	.	1	6	1	11
<i>Scorpaena brasiliensis</i>	.	.	.	.	.	.	.	.	.	.	.	1	1
<i>Selene vomer</i>	10	2	1	.	.	.	1	1	1	12	.	.	28
<i>Serraniculus pumilio</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Sicyonia laevigata</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Sicyonia</i> spp.	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Sicyonia typica</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Sphoeroides nephelus</i>	79	39	27	19	54	28	16	12	15	13	29	46	377
<i>Sphyraena barracuda</i>	5	1	.	2	.	.	.	2	.	2	.	.	12
<i>Sphyrna tiburo</i>	.	.	.	.	1	2	1	.	1	3	1	.	9
<i>Stephanolepis hispidus</i>	58	39	32	13	31	16	10	17	8	19	6	35	284
<i>Strongylura marina</i>	36	14	10	17	5	11	11	3	6	2	.	7	122
<i>Strongylura notata</i>	109	209	33	47	97	115	74	123	32	39	49	25	952
<i>Strongylura</i> spp.	.	.	1	4	14	2	5	1	1	.	1	.	29
<i>Strongylura timucu</i>	1	.	1	1	1	.	2	.	1	1	4	2	14
<i>Symphurus plagiusa</i>	20	13	22	12	16	4	40	8	9	5	24	8	181
<i>Syngnathus floridae</i>	3	.	3	3	2	5	29	3	1	8	8	7	72
<i>Syngnathus louisianae</i>	12	7	2	1	14	14	7	9	10	11	14	10	111
<i>Syngnathus scovelli</i>	14	12	16	50	32	37	45	48	11	15	15	31	326
<i>Synodus foetens</i>	82	29	38	67	111	75	31	37	27	74	47	47	665
<i>Tilapia</i> spp.	6	2	1	2	.	1	10	.	.	53	.	.	75
<i>Trachinotus carolinus</i>	14	1	1	.	.	.	5	.	.	.	.	5	26
<i>Trachinotus falcatus</i>	.	10	.	1	.	1	1	8	1	13	5	13	53
<i>Trinectes maculatus</i>	132	93	267	128	68	108	136	205	210	33	148	38	1,566
<i>Tylosurus crocodilus</i>	.	.	.	.	.	.	1	.	.	.	1	.	2
<i>Urophycis floridana</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
Totals	29,884	14,194	16,961	37,378	34,925	32,239	99,741	27,168	47,574	35,359	114,084	31,636	521,143

Appendix TB07-02. Summary by gear, stratum, and zone of species collected during Tampa Bay stratified-random sampling, 2007. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or 'offshore') within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata								Totals E=1,248
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=114	E=126	E=168	E=132	E=132	E=183	E=57	E=336	
<i>Acanthostracion quadricornis</i>	11	.	1	.	.	26	70	136	244
<i>Achirus lineatus</i>	7	4	42	85	43	1	.	73	255
<i>Adinia xenica</i>	.	1	40	42	5	.	.	.	88
<i>Aetobatus narinari</i>	.	.	.	.	.	1	.	.	1
<i>Aluterus schoepfii</i>	1	.	.	.	.	3	1	13	18
<i>Anarchopterus criniger</i>	.	.	.	.	.	.	.	1	1
<i>Anchoa cubana</i>	.	1	34	.	.	.	.	3	38
<i>Anchoa hepsetus</i>	.	16	1	67	11	.	.	205	300
<i>Anchoa lyolepis</i>	.	.	2	.	.	.	.	.	2
<i>Anchoa mitchilli</i>	22,713	10,859	83,813	131,288	61,065	.	.	18,556	328,294
<i>Ancylosetta quadrocellata</i>	.	.	.	.	.	.	.	3	3
<i>Archosargus probatocephalus</i>	10	6	38	59	67	211	250	70	711
<i>Argopecten</i> spp.	1	.	.	.	.	10	.	16	27
<i>Ariopsis felis</i>	28	53	1	4	3	653	1,544	263	2,549
<i>Bagre marinus</i>	.	.	.	.	.	73	11	23	107
<i>Bairdiella chrysoura</i>	1,155	13	153	47	189	298	656	103	2,614
<i>Bathygobius soporator</i>	.	3	3	31	61	.	.	1	99
<i>Belonesox belizanus</i>	.	.	.	4	3	.	.	.	7
<i>Brevoortia</i> spp.	.	29	1	214	140	23	1,201	12	1,620
<i>Calamus arctifrons</i>	3	5	1	.	.	1	5	4	19
<i>Callinectes ornatus</i>	.	.	2	2	.	.	.	4	8
<i>Callinectes sapidus</i>	59	30	247	332	158	249	86	1,015	2,176
<i>Callinectes similis</i>	.	.	10	.	.	.	.	3	13
<i>Caranx crysos</i>	.	.	.	.	.	1	.	.	1
<i>Caranx hippos</i>	.	.	.	.	.	8	145	.	153

Appendix TB07-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=114	E=126	E=168	E=132	E=132	E=183	E=57	E=336	
<i>Caranx latus</i>	.	.	.	.	.	3	1	.	4
<i>Carcharhinus acronotus</i>	.	.	.	.	.	1	.	.	1
<i>Carcharhinus leucas</i>	.	.	.	.	.	2	.	.	2
<i>Centropomus undecimalis</i>	1	.	10	62	130	721	254	.	1,178
<i>Centropristis striata</i>	.	.	.	.	.	7	5	6	18
<i>Chaetodipterus faber</i>	2	3	3	2	.	142	71	33	256
<i>Chaetodon ocellatus</i>	.	.	.	.	.	.	2	.	2
<i>Chasmodes saburrae</i>	22	3	19	13	6	3	2	20	88
<i>Chilomycterus schoepfii</i>	7	4	3	.	.	35	32	233	314
<i>Chloroscombrus chrysurus</i>	8	.	2	.	.	3	34	31	78
<i>Citharichthys macrops</i>	.	.	.	.	.	.	.	4	4
<i>Ctenogobius smaragdus</i>	.	.	1	1	2	.	.	.	4
<i>Cynoscion arenarius</i>	2	3	1	13	2	.	1	1,084	1,106
<i>Cynoscion nebulosus</i>	119	21	133	67	44	66	32	76	558
<i>Cyprinodon variegatus</i>	442	3	2,177	49	189	3	.	.	2,863
<i>Dactyloscopus moorei</i>	3	.	.	.	.	.	.	.	3
<i>Dasyatis sabina</i>	7	9	3	2	5	124	49	197	396
<i>Dasyatis say</i>	.	.	1	.	1	15	7	17	41
<i>Diplectrum formosum</i>	1	.	.	.	.	.	2	35	38
<i>Diplodus holbrookii</i>	7	2	1	1	.	28	109	.	148
<i>Dorosoma petenense</i>	.	.	.	4	8	.	.	.	12
<i>Echeneis</i> sp.	.	.	.	.	.	1	.	.	1
<i>Elacatinus macrodon</i>	.	.	.	.	.	.	.	5	5
<i>Elops saurus</i>	1	1	2	3	19	728	174	3	931
<i>Epinephelus itajara</i>	.	.	.	.	.	.	2	1	3
<i>Eucinostomus gula</i>	389	185	1,913	886	762	4,603	1,675	1,666	12,079
<i>Eucinostomus harengulus</i>	54	196	1,162	2,320	2,218	3,887	1,849	269	11,955
<i>Eucinostomus</i> spp.	1,900	648	5,247	3,964	3,477	1	.	1,722	16,959
<i>Eugerres plumieri</i>	.	16	6	198	168	51	7	174	620
<i>Farfantepenaeus duorarum</i>	499	68	796	283	334	30	6	903	2,919
<i>Floridichthys carpio</i>	241	76	4,070	407	349	9	.	7	5,159
<i>Fundulus grandis</i>	12	1	323	171	236	22	2	.	767
<i>Fundulus seminolis</i>	.	.	.	.	4	.	.	.	4

Appendix TB07-02. (Continued)

Species	Gear and Strata								Totals E=1,248
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl E=336	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=114	E=126	E=168	E=132	E=132	E=183	E=57		
<i>Fundulus similis</i>	3	3	710	96	857	8	15	.	1,692
<i>Gambusia holbrooki</i>	.	.	.	187	28	.	.	.	215
<i>Gerres cinereus</i>	.	.	.	.	.	1	.	.	1
<i>Gobiesox strumosus</i>	.	.	1	11	1	.	.	22	35
<i>Gobionellus oceanicus</i>	.	.	.	.	1	.	.	.	1
<i>Gobiosoma bosc</i>	3	1	2	156	174	.	.	24	360
<i>Gobiosoma longipala</i>	.	.	.	.	.	.	.	23	23
<i>Gobiosoma robustum</i>	106	64	93	10	10	.	.	55	338
<i>Gobiosoma</i> spp.	23	31	27	100	70	.	.	96	347
<i>Gymnura micrura</i>	.	.	.	.	.	25	7	7	39
<i>Haemulon plumierii</i>	4	.	1	.	.	.	5	.	10
<i>Halichoeres bivittatus</i>	3	.	2	.	.	.	.	.	5
<i>Harengula jaguana</i>	6,681	222	2,540	46	1,156	1,846	504	32	13,027
<i>Heterandria formosa</i>	.	.	.	1	1	.	.	.	2
<i>Hippocampus erectus</i>	7	1	6	.	.	1	4	85	104
<i>Hippocampus zosterae</i>	8	2	7	2	.	.	.	.	19
<i>Hypleurochilus caudovittatus</i>	.	.	.	.	.	.	.	6	6
<i>Hyporhamphus meeki</i>	14	7	.	.	.	1	5	.	27
<i>Hyporhamphus</i> spp.	1	.	.	.	.	.	.	.	1
<i>Hyporhamphus unifasciatus</i>	1	.	.	.	.	.	.	.	1
<i>Hypsoblennius hentz</i>	1	.	1	.	.	.	.	1	3
<i>Lactophrys trigonus</i>	.	.	.	.	.	.	.	1	1
<i>Lagodon rhomboides</i>	6,283	898	4,357	2,955	1,228	20,101	7,012	1,500	44,334
<i>Leiostomus xanthurus</i>	13	6	374	131	142	231	345	77	1,319
<i>Lepisosteus osseus</i>	.	.	.	1	1	2	.	8	12
<i>Lepisosteus platyrhincus</i>	.	.	.	1	.	.	.	.	1
<i>Limulus polyphemus</i>	.	2	2	.	.	8	8	37	57
<i>Lucania parva</i>	4,232	85	3,994	1,251	1,392	.	.	60	11,014
<i>Lutjanus griseus</i>	11	1	32	12	16	223	216	14	525
<i>Lutjanus synagris</i>	2	.	3	.	.	5	5	25	40
<i>Malaclemys terrapin</i>	.	.	.	.	.	1	.	.	1
<i>Megalops atlanticus</i>	.	.	.	.	.	1	.	.	1
<i>Membras martinica</i>	22	5	9	.	67	.	.	.	103

Appendix TB07-02. (Continued)

Species	Gear and Strata								Totals E=1,248
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=114	E=126	E=168	E=132	E=132	E=183	E=57	E=336	
<i>Menidia</i> spp.	865	373	5,640	9,038	5,306	.	.	14	21,236
<i>Menippe</i> spp.	.	.	.	.	1	3	.	237	241
<i>Menticirrhus americanus</i>	2	4	33	4	1	7	15	311	377
<i>Menticirrhus littoralis</i>	.	.	3	.	.	.	1	.	4
<i>Menticirrhus saxatilis</i>	8	5	4	1	1	44	.	2	65
<i>Microgobius gulosus</i>	520	508	399	539	455	.	.	305	2,726
<i>Microgobius thalassinus</i>	.	2	3	.	2	.	.	61	68
<i>Monacanthus ciliatus</i>	2	.	.	.	.	6	3	.	11
<i>Mugil cephalus</i>	.	3	261	153	7,495	922	143	.	8,977
<i>Mugil curema</i>	1	1	10	19	42	713	153	.	939
<i>Mugil gyrans</i>	1	.	47	6	4	302	75	.	435
<i>Mugil</i> sp.	.	.	.	.	.	1	.	.	1
<i>Mullus auratus</i>	.	.	.	.	.	.	.	1	1
<i>Mycteroperca microlepis</i>	9	.	.	.	.	49	43	2	103
<i>Myrophis punctatus</i>	.	.	1	.	.	.	.	.	1
<i>Nicholsina usta</i>	7	1	3	.	.	14	40	23	88
<i>Notemigonus crysoleucas</i>	.	.	.	.	1	.	.	.	1
<i>Oligoplites saurus</i>	36	44	127	104	46	18	41	2	418
<i>Opisthonema oglinum</i>	182	26	358	1	137	13	46	10	773
<i>Opsanus beta</i>	3	.	13	10	9	54	22	97	208
<i>Orthopristis chrysoptera</i>	265	45	50	137	22	358	1,096	385	2,358
<i>Parablennius marmoratus</i>	.	.	.	.	.	.	.	1	1
<i>Paralichthys albigutta</i>	.	7	7	1	1	18	16	75	125
<i>Peprilus paru</i>	.	.	.	.	.	.	1	.	1
<i>Poecilia latipinna</i>	.	2	112	439	268	1	.	.	822
<i>Pogonias cromis</i>	.	.	.	.	4	3	1	4	12
<i>Pomatomus saltatrix</i>	6	.	4	11	.	2	.	.	23
<i>Portunus</i> spp.	1	6	5	.	.	.	1	922	935
<i>Prionotus scitulus</i>	3	7	7	3	1	1	5	1,108	1,135
<i>Prionotus tribulus</i>	1	5	6	6	1	3	3	109	134
<i>Rachycentron canadum</i>	.	.	1	.	.	1	.	1	3
<i>Rhinobatos lentiginosus</i>	.	.	.	.	.	1	1	4	6
<i>Rhinoptera bonasus</i>	.	4	.	4	.	314	43	1	366

Appendix TB07-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=114	E=126	E=168	E=132	E=132	E=183	E=57	E=336	
<i>Rimapenaeus constrictus</i>	4	1	.	.	.	.	.	12	17
<i>Sardinella aurita</i>	1,627	.	7	.	.	1	.	.	1,635
<i>Sarotherodon melanotheron</i>	.	.	.	.	14	49	.	.	63
<i>Sciaenops ocellatus</i>	18	1	62	69	79	134	16	6	385
<i>Scomberomorus maculatus</i>	.	.	.	.	.	.	11	.	11
<i>Scorpaena brasiliensis</i>	.	.	.	.	.	.	.	1	1
<i>Selene vomer</i>	.	.	.	1	.	10	15	2	28
<i>Serraniculus pumilio</i>	.	.	.	.	.	.	.	1	1
<i>Sicyonia laevigata</i>	.	.	.	.	.	.	.	1	1
<i>Sicyonia</i> sp.	.	.	.	.	.	.	.	1	1
<i>Sicyonia typica</i>	.	.	.	.	.	.	.	1	1
<i>Sphoeroides nephelus</i>	42	30	80	17	13	72	45	78	377
<i>Sphyrna barracuda</i>	.	.	.	.	.	12	.	.	12
<i>Sphyrna tiburo</i>	.	.	.	.	.	6	3	.	9
<i>Stephanolepis hispidus</i>	80	7	26	.	.	23	45	103	284
<i>Strongylura marina</i>	9	3	2	11	14	22	61	.	122
<i>Strongylura notata</i>	39	13	227	60	27	495	91	.	952
<i>Strongylura</i> spp.	.	.	10	6	13	.	.	.	29
<i>Strongylura timucu</i>	.	.	2	4	6	1	1	.	14
<i>Symphurus plagiusa</i>	3	7	5	.	5	.	1	160	181
<i>Syngnathus floridae</i>	44	1	21	1	.	.	.	5	72
<i>Syngnathus louisianae</i>	23	5	12	6	2	.	.	63	111
<i>Syngnathus scovelli</i>	156	12	59	24	34	.	.	41	326
<i>Synodus foetens</i>	37	110	109	29	29	46	20	285	665
<i>Tilapia</i> spp.	1	.	1	15	2	55	.	1	75
<i>Trachinotus carolinus</i>	.	.	.	.	.	2	24	.	26
<i>Trachinotus falcatus</i>	.	.	4	.	.	13	36	.	53
<i>Trinectes maculatus</i>	.	2	4	552	393	2	4	609	1,566
<i>Tylosurus crocodilus</i>	.	.	1	.	.	.	1	.	2
<i>Urophycis floridana</i>	.	.	.	.	.	.	.	1	1
Totals	49,118	14,822	120,149	156,852	89,271	38,288	18,534	34,109	521,143

Appendix TB07-03. Summary by zone of species collected during Tampa Bay stratified-random sampling, 2007. Zones A-E were located in Tampa Bay, while Zones K (Alafia River), L (Little Manatee River), M (Manatee River), and N (Braden River) represent tributaries of Tampa Bay. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Zone									Totals E=1,248
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=72	E=168	E=108	E=72	
<i>Acanthostracion quadricornis</i>	25	89	23	40	67	.	.	.	.	244
<i>Achirus lineatus</i>	22	8	25	26	30	81	25	24	14	255
<i>Adinia xenica</i>	1	39	.	.	1	1	.	44	2	88
<i>Aetobatus narinari</i>	.	.	1	.	.	.	.	.	.	1
<i>Aluterus schoepfii</i>	.	3	4	3	8	.	.	.	.	18
<i>Anarchopterus criniger</i>	.	1	.	.	.	.	.	.	.	1
<i>Anchoa cubana</i>	.	.	3	34	1	.	.	.	.	38
<i>Anchoa hepsetus</i>	1	.	174	.	17	95	10	3	.	300
<i>Anchoa lyolepis</i>	.	.	.	2	.	.	.	.	.	2
<i>Anchoa mitchilli</i>	71,581	6,302	12,577	10,747	17,733	88,426	54,843	39,480	26,605	328,294
<i>Ancylosetta quadrocellata</i>	.	.	.	1	2	.	.	.	.	3
<i>Archosargus probatocephalus</i>	14	180	47	99	185	28	111	14	33	711
<i>Argopecten</i> spp.	.	1	1	13	12	.	.	.	.	27
<i>Ariopsis felis</i>	247	192	1,412	48	493	44	34	34	45	2,549
<i>Bagre marinus</i>	51	2	35	.	5	13	1	.	.	107
<i>Bairdiella chrysoura</i>	194	823	240	926	158	60	33	97	83	2,614
<i>Bathygobius soporator</i>	1	2	.	.	3	3	41	21	28	99
<i>Belonesox belizanus</i>	.	.	.	.	.	.	7	.	.	7
<i>Brevoortia</i> spp.	1,209	11	29	3	2	172	42	76	76	1,620
<i>Calamus arctifrons</i>	1	1	2	9	6	.	.	.	.	19
<i>Callinectes ornatus</i>	.	1	.	.	4	.	.	3	.	8
<i>Callinectes sapidus</i>	432	117	319	133	164	504	230	171	106	2,176
<i>Callinectes similis</i>	.	1	.	.	12	.	.	.	.	13
<i>Caranx crysos</i>	.	.	.	1	.	.	.	.	.	1
<i>Caranx hippos</i>	.	8	4	1	140	.	.	.	.	153
<i>Caranx latus</i>	.	3	.	1	.	.	.	.	.	4
<i>Carcharhinus acronotus</i>	.	.	1	.	.	.	.	.	.	1
<i>Carcharhinus leucas</i>	.	.	2	.	.	.	.	.	.	2
<i>Centropomus undecimalis</i>	134	251	105	151	345	8	146	8	30	1,178
<i>Centropristis striata</i>	.	2	2	12	2	.	.	.	.	18

Appendix TB07-03. (Continued)

Species	Zone									Totals E=1,248
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=72	E=168	E=108	E=72	
<i>Chaetodipterus faber</i>	46	66	41	7	85	5	2	3	1	256
<i>Chaetodon ocellatus</i>	.	.	.	2	.	.	.	.	.	2
<i>Chasmodes saburrae</i>	25	28	1	.	13	1	8	8	4	88
<i>Chilomycterus schoepfii</i>	40	119	32	45	63	.	2	13	.	314
<i>Chloroscombrus chrysurus</i>	2	7	43	14	8	4	.	.	.	78
<i>Citharichthys macrops</i>	.	.	.	1	3	.	.	.	.	4
<i>Ctenogobius smaragdus</i>	.	.	1	.	.	2	1	.	.	4
<i>Cynoscion arenarius</i>	130	.	166	.	1	732	42	4	31	1,106
<i>Cynoscion nebulosus</i>	82	109	103	30	61	21	90	34	28	558
<i>Cyprinodon variegatus</i>	149	1,694	255	434	93	166	4	48	20	2,863
<i>Dactyloscopus moorei</i>	.	3	.	.	.	.	.	.	.	3
<i>Dasyatis sabina</i>	92	65	164	22	26	11	10	5	1	396
<i>Dasyatis say</i>	4	8	18	8	2	1	.	.	.	41
<i>Diplectrum formosum</i>	.	3	.	11	24	.	.	.	.	38
<i>Diplodus holbrookii</i>	2	3	.	138	4	.	.	1	.	148
<i>Dorosoma petenense</i>	.	.	.	.	.	4	.	8	.	12
<i>Echeneis sp.</i>	.	.	1	.	.	.	.	.	.	1
<i>Elacatinus macrodon</i>	.	.	.	.	5	.	.	.	.	5
<i>Elops saurus</i>	121	403	184	32	167	4	16	4	.	931
<i>Epinephelus itajara</i>	.	2	1	.	.	.	.	.	.	3
<i>Eucinostomus gula</i>	968	2,800	740	3,487	2,252	122	804	613	293	12,079
<i>Eucinostomus harengulus</i>	3,478	1,505	1,148	373	742	432	2,057	1,227	993	11,955
<i>Eucinostomus spp.</i>	1,486	1,481	995	1,408	2,770	1,470	3,728	1,460	2,161	16,959
<i>Eugerres plumieri</i>	26	11	10	6	27	41	427	25	47	620
<i>Farfantepenaeus duorarum</i>	264	238	360	255	571	181	419	296	335	2,919
<i>Floridichthys carpio</i>	1,130	1,462	1,081	79	644	708	37	18	.	5,159
<i>Fundulus grandis</i>	14	53	133	18	142	109	60	171	67	767
<i>Fundulus seminolis</i>	.	.	.	.	.	.	4	.	.	4
<i>Fundulus similis</i>	68	67	458	38	108	343	.	563	47	1,692
<i>Gambusia holbrooki</i>	.	.	.	.	.	.	80	.	135	215
<i>Gerres cinereus</i>	.	.	.	.	1	.	.	.	.	1
<i>Gobiesox strumosus</i>	.	12	1	.	.	1	1	15	5	35
<i>Gobionellus oceanicus</i>	.	.	.	.	.	.	.	1	.	1
<i>Gobiosoma bosc</i>	3	.	2	.	1	35	144	41	134	360

Appendix TB07-03. (Continued)

Species	Zone									Totals E=1,248
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=72	E=168	E=108	E=72	
<i>Gobiosoma longipala</i>	4	3	3	8	5	.	.	.	.	23
<i>Gobiosoma robustum</i>	138	26	56	48	49	4	3	14	.	338
<i>Gobiosoma</i> spp.	43	19	21	11	9	22	154	32	36	347
<i>Gymnura micrura</i>	17	8	7	4	3	.	.	.	.	39
<i>Haemulon plumierii</i>	.	.	1	7	2	.	.	.	.	10
<i>Halichoeres bivittatus</i>	.	.	.	5	.	.	.	.	.	5
<i>Harengula jaguana</i>	236	3,787	1,326	3,831	2,643	216	889	97	2	13,027
<i>Heterandria formosa</i>	.	.	.	.	.	.	2	.	.	2
<i>Hippocampus erectus</i>	21	27	15	22	16	1	1	1	.	104
<i>Hippocampus zosterae</i>	5	1	.	5	6	.	1	1	.	19
<i>Hypleurochilus caudovittatus</i>	.	.	2	.	4	.	.	.	.	6
<i>Hyporhamphus meeki</i>	2	6	2	2	15	.	.	.	.	27
<i>Hyporhamphus</i> sp.	.	.	.	.	1	.	.	.	.	1
<i>Hyporhamphus unifasciatus</i>	.	.	.	1	.	.	.	.	.	1
<i>Hypsoblennius henz</i>	1	.	.	2	.	.	.	.	.	3
<i>Lactophrys trigonus</i>	.	.	.	.	1	.	.	.	.	1
<i>Lagodon rhomboides</i>	1,160	5,763	1,941	16,596	14,284	270	1,443	2,343	534	44,334
<i>Leiostomus xanthurus</i>	235	18	23	484	265	25	202	40	27	1,319
<i>Lepisosteus osseus</i>	1	.	2	.	.	1	8	.	.	12
<i>Lepisosteus platyrhincus</i>	.	.	.	.	.	.	.	.	1	1
<i>Limulus polyphemus</i>	17	1	14	5	3	16	.	.	1	57
<i>Lucania parva</i>	1,384	1,264	940	3,004	1,721	658	1,645	169	229	11,014
<i>Lutjanus griseus</i>	.	21	46	275	147	.	21	11	4	525
<i>Lutjanus synagris</i>	4	9	5	17	4	.	.	1	.	40
<i>Malaclemys terrapin</i>	1	.	.	.	.	.	.	.	.	1
<i>Megalops atlanticus</i>	.	1	.	.	.	.	.	.	.	1
<i>Membras martinica</i>	.	.	36	.	.	51	16	.	.	103
<i>Menidia</i> spp.	2,040	1,304	2,027	483	1,036	4,896	2,631	4,364	2,455	21,236
<i>Menippe</i> spp.	32	121	30	18	36	.	.	1	3	241
<i>Menticirrhus americanus</i>	53	6	102	22	8	144	22	14	6	377
<i>Menticirrhus littoralis</i>	.	.	.	4	.	.	.	.	.	4
<i>Menticirrhus saxatilis</i>	.	10	1	44	8	.	.	2	.	65
<i>Microgobius gulosus</i>	495	181	525	38	197	83	577	157	473	2,726
<i>Microgobius thalassinus</i>	3	1	47	2	2	9	.	4	.	68

Appendix TB07-03. (Continued)

Species	Zone									Totals E=1,248
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=72	E=168	E=108	E=72	
<i>Monacanthus ciliatus</i>	.	3	.	3	5	.	.	.	.	11
<i>Mugil cephalus</i>	186	301	436	140	266	7,415	135	69	29	8,977
<i>Mugil curema</i>	43	265	79	140	351	2	8	42	9	939
<i>Mugil gyrans</i>	45	101	87	35	157	2	4	3	1	435
<i>Mugil</i> sp.	.	1	.	.	.	.	.	.	.	1
<i>Mullus auratus</i>	.	.	.	.	1	.	.	.	.	1
<i>Mycteroperca microlepis</i>	.	3	.	83	17	.	.	.	.	103
<i>Myrophis punctatus</i>	.	.	1	.	.	.	.	.	.	1
<i>Nicholsina usta</i>	.	.	.	65	23	.	.	.	.	88
<i>Notemigonus crysoleucas</i>	.	.	.	.	.	.	.	1	.	1
<i>Oligoplites saurus</i>	84	42	88	28	26	32	29	82	7	418
<i>Opisthonema oglinum</i>	46	399	5	40	145	4	133	1	.	773
<i>Opsanus beta</i>	18	44	8	39	53	14	6	16	10	208
<i>Orthopristis chrysoptera</i>	56	162	82	1,648	212	23	36	137	2	2,358
<i>Parablennius marmoratus</i>	.	.	.	.	1	.	.	.	.	1
<i>Paralichthys albigutta</i>	8	28	17	33	29	.	4	6	.	125
<i>Peprilus paru</i>	.	.	.	1	.	.	.	.	.	1
<i>Poecilia latipinna</i>	.	1	82	.	32	9	115	132	451	822
<i>Pogonias cromis</i>	.	1	1	3	1	4	.	.	2	12
<i>Pomatomus saltatrix</i>	.	1	.	10	1	.	.	11	.	23
<i>Portunus</i> spp.	7	423	116	104	273	4	3	5	.	935
<i>Prionotus scitulus</i>	98	382	217	234	174	11	8	10	1	1,135
<i>Prionotus tribulus</i>	22	12	31	12	26	10	7	11	3	134
<i>Rachycentron canadum</i>	.	.	3	.	.	.	.	.	.	3
<i>Rhinobatos lentiginosus</i>	2	2	2	.	.	.	.	.	.	6
<i>Rhinoptera bonasus</i>	147	57	115	1	42	4	.	.	.	366
<i>Rimapenaeus constrictus</i>	.	2	8	.	7	.	.	.	.	17
<i>Sardinella aurita</i>	.	803	.	46	786	.	.	.	.	1,635
<i>Sarotherodon melanotheron</i>	.	.	1	43	5	.	11	1	2	63
<i>Sciaenops ocellatus</i>	83	25	80	12	31	40	50	32	32	385
<i>Scomberomorus maculatus</i>	.	.	2	6	3	.	.	.	.	11
<i>Scorpaena brasiliensis</i>	.	.	.	.	1	.	.	.	.	1
<i>Selene vomer</i>	.	.	1	25	1	.	1	.	.	28
<i>Serraniculus pumilio</i>	.	.	.	.	1	.	.	.	.	1

Appendix TB07-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=72	E=168	E=108	E=72		E=1,248
<i>Sicyonia laevigata</i>	.	.	.	1	.	.	.	.	.	1
<i>Sicyonia</i> sp.	.	1	.	.	.	.	.	.	.	1
<i>Sicyonia typica</i>	.	.	.	.	1	.	.	.	.	1
<i>Sphoeroides nephelus</i>	42	83	50	37	104	21	12	21	7	377
<i>Sphyaena barracuda</i>	.	.	.	6	6	.	.	.	.	12
<i>Sphyrna tiburo</i>	1	2	3	2	1	.	.	.	.	9
<i>Stephanolepis hispidus</i>	17	42	13	142	64	1	4	1	.	284
<i>Strongylura marina</i>	3	10	35	15	34	3	10	7	5	122
<i>Strongylura notata</i>	440	144	146	24	111	23	41	17	6	952
<i>Strongylura</i> spp.	2	3	1	3	1	2	11	2	4	29
<i>Strongylura timucu</i>	1	.	.	3	.	3	.	5	2	14
<i>Symphurus plagiusa</i>	28	8	80	6	14	32	10	3	.	181
<i>Syngnathus floridae</i>	.	14	1	38	18	.	.	1	.	72
<i>Syngnathus louisianae</i>	11	18	21	33	13	5	3	4	3	111
<i>Syngnathus scovelli</i>	96	62	22	13	62	18	34	11	8	326
<i>Synodus foetens</i>	84	106	132	99	137	32	29	40	6	665
<i>Tilapia</i> spp.	1	.	27	.	29	1	9	6	2	75
<i>Trachinotus carolinus</i>	.	.	20	5	1	.	.	.	.	26
<i>Trachinotus falcatus</i>	.	15	16	6	16	.	.	.	.	53
<i>Trinectes maculatus</i>	4	3	14	.	3	307	1,118	26	91	1,566
<i>Tylosurus crocodilus</i>	.	.	.	2	.	.	.	.	.	2
<i>Urophycis floridana</i>	.	1	.	.	.	.	.	.	.	1
Totals	89,510	34,323	30,159	46,782	50,953	108,246	72,905	52,487	35,778	521,143

Intentionally Left Blank

Charlotte Harbor

Charlotte Harbor is a drowned river estuary located on the southwestern coast of Florida (Charlotte Harbor National Estuary Program 2000). The bay is connected to the Gulf of Mexico by passes at Boca Grande, San Carlos, and several smaller inlets. Freshwater inflow principally comes from the Peace, Caloosahatchee, and Myakka rivers. Shoreline vegetation consists largely of fringing mangroves, and seagrasses are the dominate bottom vegetation in shallow waters.

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Charlotte Harbor since 1989. The area sampled was divided into six geographically-defined bay zones (A-E and G) and three riverine zones (H, M, and P; Figure CH07-01). Monthly stratified-random sampling (SRS) was conducted in Zones A – E and G using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zones H, M, and P with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in Charlotte Harbor.

Stratified-Random Sampling

A total of 683,793 fishes (145 taxa) and selected invertebrates (11 taxa) were collected from 1,716 Charlotte Harbor SRS samples in 2007 (Table CH07-01, Appendices CH07-01, -02, and -03). *Anchoa mitchilli* (n=354,113) was the most numerous species collected, representing 51.8% of the total catch. *Lagodon rhomboides* (n=85,970), *Eucinostomus* spp. (n=50,231), *Lucania parva* (n=39,990), *Menidia* spp. (n=26,773), and *Eucinostomus gula* (n=26,689) were the next most abundant taxa collected, accounting for an additional 33.6% of the total catch. Thirty Selected Taxa (n=19,506 animals) composed 2.9% of the total catch. *Farfantepenaeus duorarum* (n=4,899) and *Callinectes sapidus* (n=2,207) were the most abundant Selected Taxa, representing 1.0% of the total catch. *Lutjanus griseus* (n=1,916), *Menticirrhus americanus* (n=1,423), and *Mugil gyrans* (n=1,255) were the next most abundant Selected Taxa, comprising 0.7% of the total catch. Collections in 2007 included one species new to the Charlotte Harbor FIM collection:

Calamus nodosus (knobbed porgy).

Bay Sampling

21.3-m Bay Seines. A total of 269,474 animals were collected in 552 21.3-m bay seines, representing 39.4% of the overall SRS catch (Table CH07-01). *Anchoa mitchilli* (n=107,412), *L. parva* (n=39,702), *Eucinostomus* spp. (n=37,628), and *L. rhomboides* (n=32,837) were the most abundant taxa, accounting for 80.7% of the 21.3-m bay seine catch (Table CH07-02). The taxon most frequently caught in 21.3-m bay seines was *Eucinostomus* spp. (76.1% occurrence).

A total of 5,955 animals from 23 Selected Taxa were collected, representing 2.2% of the entire 21.3-m bay seine catch (Table CH07-03). *Farfantepenaeus duorarum* (n=2,634) and *M. gyrans* (n=910) were the most abundant Selected Taxa, accounting for 59.5% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m bay seines was *F. duorarum* (49.6% occurrence).

183-m Haul Seines. A total of 70,487 animals were collected in 276 183-m haul seines, representing 10.3% of the total SRS catch (Table CH07-01). *Lagodon rhomboides* (n=43,469) was the most abundant species, accounting for 61.7% of the 183-m haul seine catch (Table CH07-04). The taxa most frequently caught in 183-m haul seines were *E. gula* (71.4% occurrence) and *L. rhomboides* (69.2% occurrence).

A total of 5,536 animals from 27 Selected Taxa were collected, representing 7.9% of the entire 183-m haul seine catch (Table CH07-05). *Lutjanus griseus* (n=1,545), *Centropomus undecimalis* (n=860), *Elops saurus* (n=700), *Archosargus probatocephalus* (n=568), and *C. sapidus* (n=312) were the most abundant Selected Taxa, accounting for 72.0% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 183-m haul seines were *L. griseus* (40.9% occurrence), *C. undecimalis* (39.9% occurrence), and *A. probatocephalus* (37.0% occurrence).

6.1-m Bay Otter Trawls. A total of 30,898 animals were collected in 360 6.1-m bay otter trawls, representing 4.5% of the overall SRS catch (Table CH07-01). *Lagodon rhomboides* (n=9,116), *Portunus* spp. (n=5,116), and *E. gula* (n=2,891) were the most abundant taxa collected, accounting for 55.4% of the 6.1-m bay otter trawl catch (Table CH07-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Portunus* spp.

(64.4% occurrence) and *Prionotus scitulus* (61.4% occurrence).

A total of 4,014 animals from 15 Selected Taxa were collected, representing 13.0% of the entire 6.1-m bay otter trawl catch (Table CH07-07). *Farfantepenaeus duorarum* (n=1,011), *C. sapidus* (n=955), and *M. americanus* (n=821) were the most abundant Selected Taxa, accounting for 69.4% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 6.1-m bay otter trawls was *C. sapidus* (50.6% occurrence).

River Sampling

21.3-m River Seines. A total of 299,600 animals were collected in 372 21.3-m river seines, representing 43.8% of the overall SRS catch (Table CH07-01). *Anchoa mitchilli* (n=236,390), *Menidia* spp. (n=18,418), *Eucinostomus* spp. (n=11,582), and *Harengula jaguana* (n=7,825) were the most abundant taxa collected, accounting for 91.5% of the 21.3-m river seine catch (Table CH07-08). The taxon most frequently caught in 21.3-m river seines was *Menidia* spp. (68.0% occurrence).

A total of 1,611 animals from 18 Selected Taxa were collected, representing 0.5% of the entire 21.3-m river seine catch (Table CH07-09). *Mugil cephalus* (n=563) and *F. duorarum* (n=281) were the most abundant Selected Taxa, accounting for 52.4% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m river seines was *F. duorarum* (22.3% occurrence).

6.1-m River Otter Trawls. A total of 13,334 animals were collected in 156 6.1-m river otter trawls, representing 2.0% of the overall SRS catch (Table CH07-01). *Anchoa mitchilli* (n=9,135) was the most abundant species collected, accounting for 68.5% of the 6.1-m river trawl catch (Table CH07-10). The taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (71.2% occurrence) and *F. duorarum* (53.8% occurrence).

A total of 2,390 animals from 11 Selected Taxa were collected, representing 17.9% of the entire 6.1-m river otter trawl catch (Table CH07-11). *Farfantepenaeus duorarum* (n=890), *Cynoscion arenarius* (n=624), *M. americanus* (n=427), and *C. sapidus* (n=401) were the most abundant Selected Taxa, accounting for 98.0% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in the 6.1-m river otter trawls was *C. sapidus* (71.2% occurrence).

References

Charlotte Harbor National Estuary Program. 2000. Comprehensive Conservation and Management Plan, Volume 1. 250 pp.

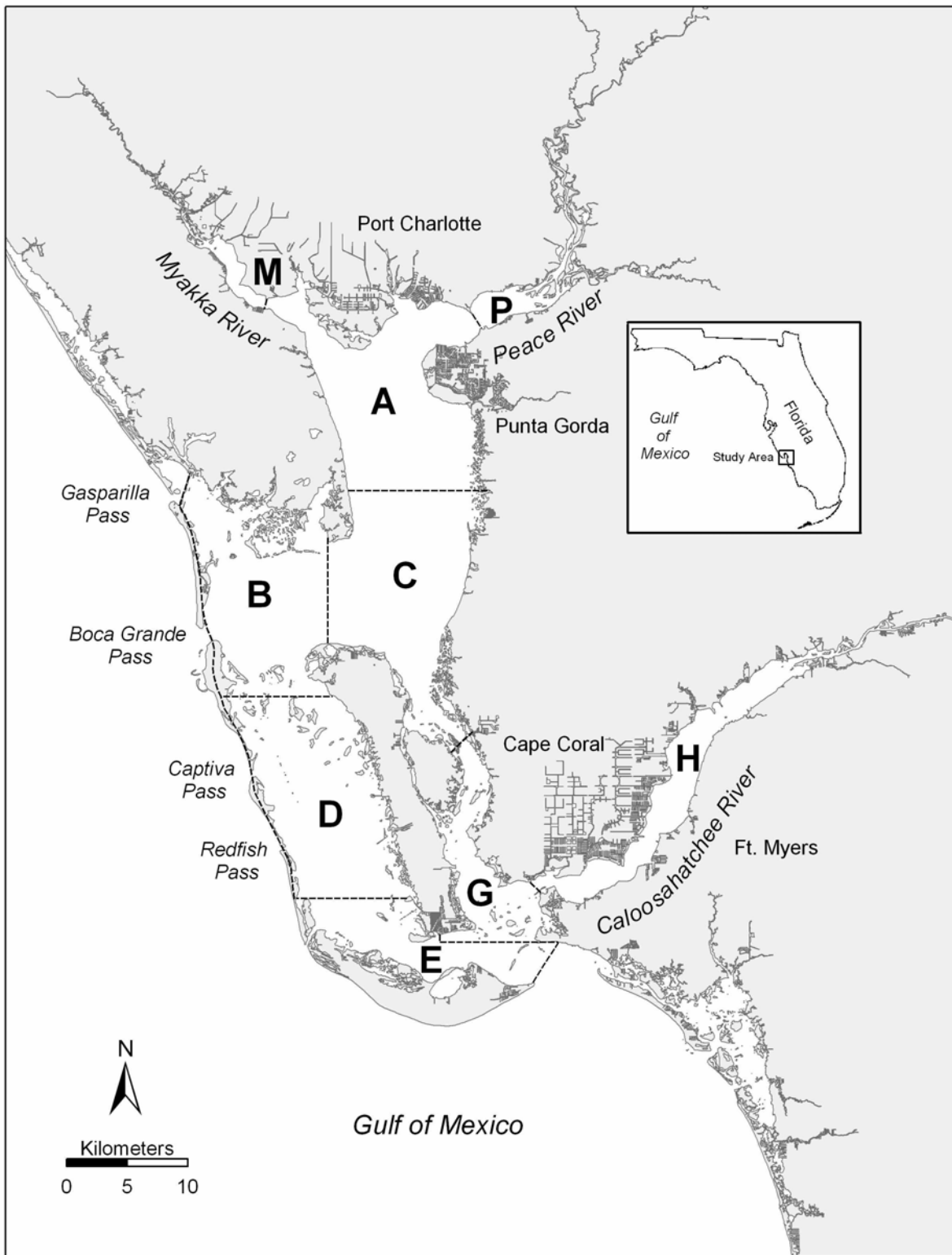


Figure CH07-01. Map of Charlotte Harbor sampling area. Zones are labeled A - E, G, H, M and P.

Table CH07-01. Summary of catch and effort data for Charlotte Harbor stratified-random sampling, 2007.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	34,958	120	.	.	1,971	60	5,669	84	42,598	264
B	39,922	97	.	.	26,239	48	7,101	72	73,262	217
C	38,095	95	.	.	8,101	48	4,536	72	50,732	215
D	50,994	96	.	.	18,706	48	8,294	60	77,994	204
E	17,553	72	.	.	8,543	36	3,785	36	29,881	144
G	87,952	72	.	.	6,927	36	1,513	36	96,392	144
H	.	.	194,802	276	.	.	4,381	84	199,183	360
M	.	.	33,567	48	.	.	2,130	36	35,697	84
P	.	.	71,231	48	.	.	6,823	36	78,054	84
Totals	269,474	552	299,600	372	70,487	276	44,232	516	683,793	1,716

Table CH07-02. Catch statistics for 10 dominant taxa collected in 552 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	107,412	39.9	16.7	138.99	66.49	1,123.92	32,914.29	33	0.02	15	58
<i>Lucania parva</i>	39,702	14.7	44.7	51.37	7.20	329.06	1,337.14	25	0.03	11	42
<i>Eucinostomus</i> spp.	37,628	14.0	76.1	48.69	4.16	200.69	1,057.14	28	0.03	8	39
<i>Lagodon rhomboides</i>	32,837	12.2	61.1	42.49	5.33	294.48	1,708.57	42	0.09	12	157
<i>Eucinostomus gula</i>	9,205	3.4	61.8	11.91	0.95	186.99	192.14	54	0.10	40	112
<i>Harengula jaguana</i>	8,979	3.3	12.3	11.62	6.78	1,370.35	3,657.14	37	0.11	15	95
<i>Menidia</i> spp.	8,354	3.1	22.5	10.81	2.22	482.42	788.57	39	0.15	16	86
<i>Floridichthys carpio</i>	4,098	1.5	21.6	5.30	1.00	443.61	347.14	31	0.17	8	65
<i>Microgobius gulosus</i>	3,208	1.2	41.7	4.15	0.66	371.69	187.14	28	0.11	10	55
<i>Farfantepenaeus duorarum</i>	2,634	1.0	49.6	3.41	0.43	294.52	104.29	11	0.09	2	39
Subtotal	254,057	94.3	.	.	.	.	.	.	.	2	157
Totals	269,474	100.0	.	348.70	74.12	499.38	37,054.29	.	.	2	620

Table CH07-03. Catch statistics for Selected Taxa collected in 552 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus duorarum</i>	2,634	1.0	49.6	3.41	0.43	294.52	104.29	11	0.09	2	39
<i>Mugil gyrans</i>	910	0.3	2.2	1.18	1.04	2,080.78	574.29	21	0.21	14	124
<i>Mugil curema</i>	584	0.2	1.6	0.76	0.70	2,174.87	385.71	35	0.29	25	85
<i>Callinectes sapidus</i>	401	0.1	19.2	0.52	0.13	585.07	54.29	25	1.32	3	180
<i>Cynoscion nebulosus</i>	376	0.1	20.7	0.49	0.07	326.53	15.71	41	1.38	12	390
<i>Lutjanus griseus</i>	213	0.1	17.6	0.28	0.03	293.93	9.29	78	3.24	12	210
<i>Sciaenops ocellatus</i>	210	0.1	4.9	0.27	0.11	911.12	43.57	40	3.51	10	405
<i>Mugil cephalus</i>	142	0.1	2.4	0.18	0.10	1,286.99	49.29	24	0.30	17	38
<i>Archosargus probatocephalus</i>	115	0.0	7.1	0.15	0.04	604.20	12.86	45	4.46	16	252
<i>Lutjanus synagris</i>	111	0.0	4.3	0.14	0.05	825.06	19.29	42	1.43	19	130
<i>Leiostomus xanthurus</i>	83	0.0	3.8	0.11	0.05	1,069.35	25.00	34	1.96	12	142
<i>Menticirrhus americanus</i>	58	0.0	2.5	0.08	0.04	1,384.42	23.57	29	1.38	13	72
<i>Trachinotus falcatus</i>	38	0.0	0.9	0.05	0.04	1,989.35	22.86	33	1.12	22	55
<i>Menticirrhus saxatilis</i>	19	0.0	1.8	0.02	0.01	1,008.13	5.00	29	2.90	11	51
<i>Mycteroperca microlepis</i>	17	0.0	1.3	0.02	0.01	1,225.42	5.71	102	20.73	23	225
<i>Paralichthys albigutta</i>	10	0.0	1.4	0.01	0.00	874.18	1.43	118	31.16	37	290
<i>Cynoscion arenarius</i>	8	0.0	1.1	0.01	0.00	1,013.34	1.43	37	5.74	16	55

Table CH07-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Centropomus undecimalis</i>	8	0.0	0.9	0.01	0.01	1,171.53	2.14	218	59.75	34	509
<i>Albula vulpes</i>	7	0.0	0.5	0.01	0.01	1,742.74	3.57	33	4.65	20	58
<i>Menticirrhus littoralis</i>	5	0.0	0.2	0.01	0.01	2,349.47	3.57	71	3.65	60	82
<i>Elops saurus</i>	3	0.0	0.5	0.00	0.00	1,354.00	0.71	261	19.03	225	290
<i>Menippe</i> spp.	2	0.0	0.4	0.00	0.00	1,659.82	0.71	29	11.50	17	40
<i>Pomatomus saltatrix</i>	1	0.0	0.2	0.00	0.00	2,349.47	0.71	46	.	46	46
Totals	5,955	2.2	73.4	7.71	1.81	552.18	960.71	.	.	2	509

Table CH07-04. Catch statistics for 10 dominant taxa collected in 276 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	43,469	61.7	69.2	157.50	27.22	287.08	6,353.00	93	0.11	36	207
<i>Eucinostomus gula</i>	11,854	16.8	71.4	42.95	11.54	446.43	2,956.00	80	0.09	40	130
<i>Eucinostomus harengulus</i>	1,785	2.5	42.8	6.47	1.52	390.55	349.00	89	0.28	48	134
<i>Lutjanus griseus</i>	1,545	2.2	40.9	5.60	1.13	333.89	196.00	136	0.78	67	265
<i>Orthopristis chrysoptera</i>	1,378	2.0	19.9	4.99	1.43	476.55	286.00	113	0.64	41	173
<i>Nicholsina usta</i>	1,317	1.9	12.3	4.77	2.10	731.12	424.00	118	0.56	54	175
<i>Ariopsis felis</i>	927	1.3	27.9	3.36	0.87	428.02	189.00	241	1.56	136	374
<i>Centropomus undecimalis</i>	860	1.2	39.9	3.12	0.50	264.62	64.00	444	3.50	238	950
<i>Elops saurus</i>	700	1.0	25.7	2.54	0.74	484.84	163.00	294	2.20	116	498
<i>Harengula jaguana</i>	688	1.0	13.4	2.49	0.78	519.52	148.00	100	0.57	60	144
Subtotal	64,523	91.6	.	.	.	.	.	.	.	36	950
Totals	70,487	100.0	.	255.39	38.40	249.80	9,368.00	.	.	12	1400

Table CH07-05. Catch statistics for Selected Taxa collected in 276 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lutjanus griseus</i>	1,545	2.2	40.9	5.60	1.13	333.89	196.00	136	0.78	67	265
<i>Centropomus undecimalis</i>	860	1.2	39.9	3.12	0.50	264.62	64.00	444	3.50	238	950
<i>Elops saurus</i>	700	1.0	25.7	2.54	0.74	484.84	163.00	294	2.20	116	498
<i>Archosargus probatocephalus</i>	568	0.8	37.0	2.06	0.45	360.20	102.00	217	2.63	62	419
<i>Callinectes sapidus</i>	312	0.4	32.6	1.13	0.21	302.58	43.00	97	1.97	32	198
<i>Sciaenops ocellatus</i>	201	0.3	25.7	0.73	0.15	341.87	27.00	403	10.51	71	671
<i>Mugil cephalus</i>	193	0.3	21.4	0.70	0.15	350.51	21.00	246	5.96	112	420
<i>Mycteroperca microlepis</i>	191	0.3	12.3	0.69	0.19	455.19	35.00	169	2.92	62	345
<i>Mugil gyrans</i>	178	0.3	13.4	0.64	0.15	379.49	23.00	178	3.04	98	327
<i>Lutjanus synagris</i>	178	0.3	10.1	0.64	0.21	533.80	45.00	101	1.38	58	169
<i>Cynoscion nebulosus</i>	90	0.1	15.6	0.33	0.06	317.44	11.00	206	10.04	52	449
<i>Trachinotus falcatus</i>	87	0.1	3.6	0.32	0.20	1,028.70	47.00	213	7.18	40	423
<i>Leiostomus xanthurus</i>	84	0.1	6.5	0.30	0.14	748.85	35.00	100	2.48	43	172
<i>Farfantepenaeus duorarum</i>	83	0.1	12.7	0.30	0.07	380.49	10.00	23	0.62	12	45
<i>Paralichthys albigutta</i>	75	0.1	16.3	0.27	0.06	355.49	11.00	169	9.66	55	440
<i>Mugil curema</i>	67	0.1	6.9	0.24	0.09	607.83	19.00	169	7.41	100	325
<i>Cynoscion arenarius</i>	34	0.0	0.7	0.12	0.12	1,613.02	33.00	233	5.20	140	296

Table CH07-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Trachinotus carolinus</i>	23	0.0	5.4	0.08	0.02	474.97	3.00	322	5.75	260	379
<i>Scomberomorus maculatus</i>	18	0.0	2.9	0.07	0.03	672.04	5.00	258	18.99	150	410
<i>Pogonias cromis</i>	13	0.0	2.9	0.05	0.02	750.76	5.00	290	16.30	211	367
<i>Epinephelus itajara</i>	11	0.0	4.0	0.04	0.01	491.72	1.00	184	17.86	105	275
<i>Epinephelus morio</i>	11	0.0	1.1	0.04	0.03	1,374.80	9.00	104	2.32	95	115
<i>Menippe</i> spp.	4	0.0	1.4	0.01	0.01	826.12	1.00	42	4.38	36	55
<i>Rachycentron canadum</i>	4	0.0	0.7	0.01	0.01	1,311.96	3.00	882	39.37	815	988
<i>Megalops atlanticus</i>	2	0.0	0.7	0.01	0.01	1,172.60	1.00	658	32.50	625	690
<i>Pomatomus saltatrix</i>	2	0.0	0.7	0.01	0.01	1,172.60	1.00	412	3.50	408	415
<i>Menticirrhus americanus</i>	2	0.0	0.7	0.01	0.01	1,172.60	1.00	171	70.50	100	241
Totals	5,536	7.9	94.2	20.06	1.91	157.86	219.00	.	.	12	988

Table CH07-06. Catch statistics for 10 dominant taxa collected in 360 bay 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	9,116	29.5	46.7	1.93	0.32	311.79	43.04	78	0.26	13	160
<i>Portunus</i> spp.	5,116	16.6	64.4	1.02	0.14	268.28	28.74	45	0.15	8	98
<i>Eucinostomus gula</i>	2,891	9.4	31.7	0.57	0.10	332.85	17.34	77	0.27	40	116
<i>Prionotus scitulus</i>	1,191	3.9	61.4	0.23	0.02	180.59	4.11	97	1.01	12	225
<i>Anchoa mitchilli</i>	1,176	3.8	4.2	0.22	0.12	1,030.86	39.40	37	00.25	22	65
<i>Farfantepenaeus duorarum</i>	1,011	3.3	34.4	0.21	0.10	868.26	33.66	17	0.28	5	45
<i>Callinectes sapidus</i>	955	3.1	50.6	0.20	0.03	259.48	7.29	88	0.96	10	185
<i>Stephanolepis hispidus</i>	1,011	3.3	37.8	0.20	0.04	430.01	7.83	66	0.62	14	162
<i>Orthopristis chrysoptera</i>	1,014	3.3	18.6	0.19	0.05	524.64	12.08	94	0.98	15	163
<i>Eucinostomus</i> spp.	927	3.0	20.6	0.18	0.04	460.34	7.62	29	0.21	15	39
Subtotal	24,408	79.2	.	.	.	.	.	.	.	5	225
Totals	30,898	100.0	.	6.29	0.58	176.26	97.21	.	.	4	887

Table CH07-07. Catch statistics for Selected Taxa collected in 360 bay 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus duorarum</i>	1,011	3.3	34.4	0.21	0.10	868.26	33.66	17	0.28	5	45
<i>Callinectes sapidus</i>	955	3.1	50.6	0.20	0.03	259.48	7.29	88	0.96	10	185
<i>Menticirrhus americanus</i>	821	2.7	9.2	0.15	0.12	1,495.44	43.44	51	1.18	12	255
<i>Lutjanus synagris</i>	397	1.3	25.8	0.08	0.01	295.57	2.43	79	1.53	18	150
<i>Menippe</i> spp.	353	1.1	22.2	0.07	0.02	451.71	5.06	21	0.90	4	98
<i>Cynoscion arenarius</i>	239	0.8	3.6	0.04	0.03	1,137.25	6.88	41	2.27	18	192
<i>Lutjanus griseus</i>	133	0.4	7.8	0.03	0.01	470.44	1.28	118	2.29	20	165
<i>Paralichthys albigutta</i>	52	0.2	11.4	0.01	0.00	303.45	0.22	184	9.59	30	373
<i>Mycteroperca microlepis</i>	20	0.1	2.8	0.00	0.00	891.92	0.61	99	11.89	18	255
<i>Leiostomus xanthurus</i>	12	0.0	1.1	0.00	0.00	1,568.87	1.21	139	7.85	100	205
<i>Cynoscion nebulosus</i>	11	0.0	1.9	0.00	0.00	822.30	0.20	149	43.37	19	468
<i>Epinephelus morio</i>	5	0.0	1.1	0.00	0.00	1,000.39	0.13	91	17.03	35	129
<i>Archosargus probatocephalus</i>	2	0.0	0.6	0.00	0.00	1,412.64	0.13	107	8.50	98	115
<i>Menticirrhus saxatilis</i>	2	0.0	0.6	0.00	0.00	1,339.77	0.07	224	1.50	222	225
<i>Rachycentron canadum</i>	1	0.0	0.3	0.00	0.00	1,897.37	0.07	722	.	722	722
Totals	4,014	13.0	84.2	0.81	0.20	472.78	56.53	.	.	4	722

Table CH07-08. Catch statistics for 10 dominant taxa collected in 372 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	236,390	78.9	50.8	934.50	242.48	500.46	54,964.71	31	0.01	15	65
<i>Menidia</i> spp.	18,418	6.1	68.0	72.81	8.78	232.52	1,585.29	35	0.07	12	70
<i>Eucinostomus</i> spp.	11,582	3.9	64.2	45.79	5.12	215.75	800.00	29	0.06	10	39
<i>Harengula jaguana</i>	7,825	2.6	6.2	30.93	21.53	1,342.14	7,930.88	52	0.09	24	94
<i>Eucinostomus harengulus</i>	4,548	1.5	58.1	17.98	2.13	228.33	389.71	58	0.16	40	96
<i>Gambusia holbrooki</i>	3,319	1.1	18.3	13.12	3.91	575.34	995.59	24	0.08	12	38
<i>Trinectes maculatus</i>	3,311	1.1	33.9	13.09	6.35	936.39	2,294.12	21	0.12	9	54
<i>Microgobius gulosus</i>	2,513	0.8	48.9	9.93	2.78	539.78	905.88	28	0.14	10	58
<i>Eucinostomus gula</i>	2,433	0.8	26.3	9.62	1.82	365.50	413.24	53	0.17	40	92
<i>Lophogobius cyprinoides</i>	1,744	0.6	7.3	6.89	4.75	1,328.75	1,710.29	21	0.15	12	61
Subtotal	292,083	97.4	.	.	.	.	.	.	.	9	96
Totals	299,600	100.0	.	1,184.38	244.11	397.52	55,101.47	.	.	2	740

Table CH07-09.

Catch statistics for Selected Taxa collected in 372 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Mugil cephalus</i>	563	0.2	7.0	2.23	1.26	1,088.87	455.88	36	0.91	20	363
<i>Farfantepenaeus duorarum</i>	281	0.1	22.3	1.11	0.22	388.72	48.53	9	0.26	2	31
<i>Mugil gyrans</i>	167	0.1	2.2	0.66	0.53	1,551.85	195.59	39	0.76	16	52
<i>Callinectes sapidus</i>	138	0.0	13.7	0.55	0.13	444.51	30.88	25	2.20	4	183
<i>Menticirrhus americanus</i>	115	0.0	6.7	0.45	0.18	765.46	47.06	32	0.88	14	82
<i>Elops saurus</i>	78	0.0	4.6	0.31	0.11	658.67	26.47	54	3.00	25	128
<i>Sciaenops ocellatus</i>	64	0.0	5.1	0.25	0.08	613.26	20.59	41	4.72	10	298
<i>Centropomus undecimalis</i>	47	0.0	5.9	0.19	0.05	527.94	11.76	337	14.85	129	740
<i>Cynoscion nebulosus</i>	38	0.0	4.8	0.15	0.05	579.75	10.29	39	2.67	14	80
<i>Cynoscion arenarius</i>	37	0.0	4.0	0.15	0.06	733.23	13.24	33	1.64	19	54
<i>Leiostomus xanthurus</i>	29	0.0	1.3	0.11	0.07	1,207.49	22.06	33	3.91	24	140
<i>Archosargus probatocephalus</i>	17	0.0	3.5	0.07	0.02	624.56	5.88	192	25.64	14	360
<i>Lutjanus griseus</i>	12	0.0	3.0	0.05	0.01	593.81	2.94	86	15.48	21	183
<i>Mugil curema</i>	8	0.0	1.1	0.03	0.02	1,127.91	5.88	99	3.48	84	111
<i>Pogonias cromis</i>	7	0.0	0.8	0.03	0.02	1,430.14	7.35	27	4.35	12	49
<i>Lutjanus synagris</i>	6	0.0	0.8	0.02	0.01	1,200.22	4.41	33	4.30	23	50
<i>Menticirrhus saxatilis</i>	3	0.0	0.5	0.01	0.01	1,436.04	2.94	30	9.82	17	49
<i>Epinephelus itajara</i>	1	0.0	0.3	0.00	0.00	1,928.73	1.47	320	.	320	320
Totals	1,611	0.5	51.9	6.37	1.87	567.27	673.53	.	.	2	740

Table CH07-10. Catch statistics for 10 dominant taxa collected in 156 river 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	9,135	68.5	35.3	7.98	2.48	387.75	299.24	38	0.09	15	70
<i>Farfantepenaeus duorarum</i>	890	6.7	53.8	0.77	0.18	288.93	15.65	12	0.22	4	40
<i>Cynoscion arenarius</i>	624	4.7	28.8	0.54	0.18	414.06	20.78	34	0.97	11	165
<i>Trinectes maculatus</i>	472	3.5	40.4	0.41	0.17	513.39	21.59	38	0.87	10	101
<i>Menticirrhus americanus</i>	427	3.2	39.1	0.37	0.08	277.78	7.96	66	2.47	15	285
<i>Callinectes sapidus</i>	401	3.0	71.2	0.35	0.04	136.18	3.37	105	2.48	9	229
<i>Ariopsis felis</i>	318	2.4	32.1	0.28	0.13	574.95	19.43	139	5.70	41	335
<i>Eucinostomus gula</i>	306	2.3	26.9	0.27	0.08	365.72	9.85	64	0.75	40	100
<i>Bairdiella chrysoura</i>	123	0.9	14.7	0.11	0.04	462.00	4.86	64	3.48	13	146
<i>Eucinostomus</i> spp.	94	0.7	18.6	0.08	0.03	393.90	3.24	27	0.74	15	39
Subtotal	12,790	95.9	.	.	.	.	.	.	.	4	335
Totals	13,334	100.0	.	11.62	2.63	282.50	307.88	.	.	4	990

Table CH07-11. Catch statistics for Selected Taxa collected in 156 river 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus duorarum</i>	890	6.7	53.8	0.77	0.18	288.93	15.65	12	0.22	4	40
<i>Cynoscion arenarius</i>	624	4.7	28.8	0.54	0.18	414.06	20.78	34	0.97	11	165
<i>Menticirrhus americanus</i>	427	3.2	39.1	0.37	0.08	277.78	7.96	66	2.47	15	285
<i>Callinectes sapidus</i>	401	3.0	71.2	0.35	0.04	136.18	3.37	105	2.48	9	229
<i>Lutjanus griseus</i>	13	0.1	4.5	0.01	0.01	593.49	0.75	115	12.46	28	155
<i>Lutjanus synagris</i>	13	0.1	7.1	0.01	0.00	380.55	0.27	47	4.53	25	79
<i>Epinephelus itajara</i>	7	0.1	1.9	0.01	0.00	924.70	0.67	237	14.54	180	305
<i>Cynoscion nebulosus</i>	6	0.0	3.8	0.01	0.00	501.61	0.13	49	18.83	24	142
<i>Leiostomus xanthurus</i>	4	0.0	2.6	0.00	0.00	618.43	0.13	113	18.86	62	152
<i>Menippe</i> spp.	3	0.0	1.9	0.00	0.00	717.37	0.15	45	12.66	29	70
<i>Paralichthys albigutta</i>	2	0.0	1.3	0.00	0.00	880.32	0.13	70	47.50	22	117
Totals	2,390	17.9	89.1	2.07	0.38	230.41	39.53	.	.	4	305

Appendix CH07-01. Monthly summary of species collected during Charlotte Harbor stratified-random sampling, 2007. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143		E=1,716
<i>Acanthostracion quadricornis</i>	5	8	2	6	5	14	20	26	8	6	4	11	115
<i>Achirus lineatus</i>	6	.	5	5	9	21	9	22	22	48	28	7	182
<i>Adinia xenica</i>	5	10	30	12	.	.	.	.	.	.	.	.	57
<i>Aetobatus narinari</i>	.	.	.	.	.	2	.	.	.	1	.	.	3
<i>Albula vulpes</i>	.	.	.	1	1	5	.	.	.	.	.	.	7
<i>Aluterus schoepfii</i>	.	.	.	.	2	11	15	20	.	.	2	.	50
<i>Anarchopterus criniger</i>	.	.	.	.	2	1	.	1	.	.	.	.	4
<i>Anchoa hepsetus</i>	.	.	.	85	15	48	16	1	3	.	.	80	248
<i>Anchoa mitchilli</i>	5,567	20,515	12,434	5,570	4,572	44,854	52,541	40,193	11,334	32,597	85,273	38,663	354,113
<i>Ancylopsetta quadrocellata</i>	.	2	1	3	1	3	1	.	.	.	.	.	11
<i>Archosargus probatocephalus</i>	86	38	24	42	56	71	60	35	29	41	79	141	702
<i>Argopecten irradians</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Ariopsis felis</i>	39	20	37	30	221	210	95	142	262	184	89	53	1,382
<i>Astroscopus y-graecum</i>	1	.	.	.	.	.	.	.	.	.	.	.	1
<i>Bagre marinus</i>	3	2	1	4	6	5	11	5	8	5	7	4	61
<i>Bairdiella chrysoura</i>	128	32	9	24	541	171	225	53	255	220	103	15	1,776
<i>Bathygobius soporator</i>	.	.	1	1	.	1	.	2	.	2	4	.	11
<i>Brevoortia</i> spp.	.	2	.	16	.	2	.	1	6	1	8	.	36
<i>Calamus arctifrons</i>	9	7	3	2	14	.	1	3	.	2	1	1	43
<i>Calamus nodosus</i>	.	.	.	.	.	.	.	2	.	.	.	.	2
<i>Calamus</i> spp.	.	.	.	.	.	.	.	7	.	.	.	.	7
<i>Callinectes ornatus</i>	1	1	.	2	38	22	26	69	13	1	5	2	180
<i>Callinectes sapidus</i>	122	187	321	225	164	216	166	123	130	166	309	78	2,207
<i>Callinectes</i> sp.	.	1	.	.	.	.	.	.	.	.	.	.	1

Appendix CH07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=1,716
<i>Caranx hippos</i>	5	.	2	1	3	8	6	2	3	8	11	17	66
<i>Centropomus undecimalis</i>	43	17	60	21	80	41	208	59	95	57	142	92	915
<i>Centropristis striata</i>	.	.	.	3	1	.	.	2	.	.	.	.	6
<i>Chaetodipterus faber</i>	5	.	5	.	21	38	94	25	71	52	62	4	377
<i>Chasmodes saburrae</i>	11	7	12	11	10	18	3	8	15	5	16	15	131
<i>Chelonia mydas</i>	1	.	.	.	.	1	.	.	.	1	.	.	3
<i>Chilomycterus schoepfii</i>	113	38	39	51	56	81	98	75	52	133	66	42	844
<i>Chloroscombrus chrysurus</i>	.	.	.	.	.	3	3	7	14	43	10	4	84
<i>Cichlasoma urophthalmus</i>	4	42	1	.	2	.	4	.	35	34	1	50	173
<i>Citharichthys macrops</i>	14	3	3	6	29	9	13	4	5	5	6	12	109
<i>Cynoscion arenarius</i>	18	11	1	2	14	40	50	510	188	29	44	35	942
<i>Cynoscion nebulosus</i>	11	22	6	1	28	63	88	78	87	72	53	12	521
<i>Cyprinodon variegatus</i>	21	650	1	173	21	125	4	.	13	61	415	71	1,555
<i>Dasyatis americana</i>	2	.	.	.	1	2	5	2	1	4	5	1	23
<i>Dasyatis sabina</i>	14	3	10	11	16	32	12	11	11	26	9	14	169
<i>Dasyatis say</i>	1	1	1	.	6	3	2	1	1	.	10	.	26
<i>Diodon holocanthus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Diplectrum formosum</i>	4	2	.	13	2	17	11	21	5	3	6	4	88
<i>Diplodus holbrookii</i>	.	.	.	1	.	.	.	.	1	1	.	.	3
<i>Echeneis neucratoides</i>	.	.	.	1	.	1	.	1	.	.	.	.	3
<i>Elops saurus</i>	97	191	14	25	43	110	27	54	17	58	31	114	781
<i>Epinephelus itajara</i>	1	5	.	.	2	3	1	2	1	2	2	.	19
<i>Epinephelus morio</i>	.	.	.	.	.	.	1	2	2	10	.	1	16
<i>Etheostoma fusiforme</i>	4	.	.	.	.	.	.	.	.	.	.	.	4
<i>Etropus crossotus</i>	3	.	.	.	.	.	.	1	2	1	4	4	15
<i>Eucinostomus gula</i>	1,293	2,072	1,228	1,979	1,964	1,491	1,302	1,998	2,093	2,546	2,886	5,837	26,689

Appendix CH07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	
<i>Eucinostomus harengulus</i>	729	364	698	793	967	668	1,046	876	758	829	346	412	8,486
<i>Eucinostomus jonesii</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Eucinostomus spp.</i>	2,352	3,859	2,763	2,169	1,474	4,116	4,259	4,891	5,329	5,787	6,549	6,683	50,231
<i>Eugerres plumieri</i>	9	2	.	6	26	49	85	150	37	24	2	13	403
<i>Farfantepenaeus duorarum</i>	278	198	178	132	73	326	183	1,587	1,124	390	269	161	4,899
<i>Floridichthys carpio</i>	297	347	146	250	184	557	647	33	77	355	1,061	310	4,264
<i>Fundulus confluentus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Fundulus grandis</i>	56	146	73	35	10	1	11	1	2	102	58	42	537
<i>Fundulus seminolis</i>	11	1	1	.	4	.	3	.	.	.	2	.	22
<i>Fundulus similis</i>	25	11	28	252	3	725	1	1	9	50	18	58	1,181
<i>Gambusia holbrooki</i>	274	1,101	331	3	173	25	226	10	15	830	157	179	3,324
<i>Ginglymostoma cirratum</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Gobiesox strumosus</i>	2	2	.	4	1	4	1	4	1	.	1	.	20
<i>Gobiosoma bosc</i>	10	7	28	40	35	76	45	3	34	37	7	21	343
<i>Gobiosoma longipala</i>	.	11	.	1	14	2	.	.	5	2	14	.	49
<i>Gobiosoma robustum</i>	91	111	148	188	80	40	316	26	121	84	115	158	1,478
<i>Gobiosoma spp.</i>	27	14	29	84	46	69	58	72	150	305	164	116	1,134
<i>Gymnura micrura</i>	.	.	.	.	.	1	.	2	.	1	.	.	4
<i>Haemulon plumierii</i>	.	2	.	.	.	.	3	6	8	1	.	6	26
<i>Halichoeres bivittatus</i>	.	.	.	.	.	1	.	2	.	.	.	.	3
<i>Harengula jaguana</i>	156	156	519	56	110	1,399	5,911	925	980	5,759	688	871	17,530
<i>Hemichromis letourneuxi</i>	.	.	.	.	.	.	1	.	.	.	.	3	4
<i>Hippocampus erectus</i>	25	14	21	21	31	48	33	23	2	3	6	4	231
<i>Hippocampus zosterae</i>	7	4	13	6	4	1	1	2	10	3	3	4	58
<i>Hypoatherina harringtonensis</i>	.	.	.	.	.	.	.	.	.	1	1	3	5

Appendix CH07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=1,716
<i>Hyporhamphus meeki</i>	11	.	.	.	6	.	.	2	7	3	20	1	50
<i>Hyporhamphus</i> sp.	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Hyporhamphus unifasciatus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Hypsoblennius hentz</i>	.	.	.	.	1	1	3	.	.	.	.	2	7
<i>Jordanella floridae</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Labidesthes sicculus</i>	19	.	.	.	.	.	.	.	.	3	.	.	22
<i>Lactophrys trigonus</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Lagodon rhomboides</i>	1,338	2,514	5,889	10,446	10,078	7,087	5,693	7,790	8,310	7,650	9,252	9,923	85,970
<i>Leiostomus xanthurus</i>	5	17	43	60	23	44	11	3	4	2	.	.	212
<i>Lepisosteus osseus</i>	1	.	1	.	.	1	4	3	.	9	.	.	19
<i>Lepisosteus platyrhincus</i>	1	4	.	.	.	.	.	.	1	.	.	.	6
<i>Lepomis macrochirus</i>	6	15	12	.	.	.	.	4	1	.	.	.	38
<i>Limulus polyphemus</i>	1	.	1	2	15	.	1	1	.	.	5	1	27
<i>Lophogobius cyprinoides</i>	.	2	18	2	1,219	15	92	102	2	9	2	296	1,759
<i>Lucania goodei</i>	7	11	4	.	.	.	.	1	.	.	.	.	23
<i>Lucania parva</i>	1,192	4,290	3,480	3,518	5,190	3,184	7,469	2,875	1,743	3,236	2,230	1,583	39,990
<i>Lutjanus griseus</i>	13	13	10	23	62	134	194	291	344	326	247	259	1,916
<i>Lutjanus synagris</i>	10	1	2	12	27	30	42	86	102	164	130	99	705
<i>Malaclemys terrapin</i>	.	.	.	.	.	.	1	.	3	.	.	.	4
<i>Megalops atlanticus</i>	.	.	.	.	.	.	1	.	1	.	.	.	2
<i>Membras martinica</i>	1	.	.	.	61	578	48	56	.	103	8	.	855
<i>Menidia</i> spp.	1,264	2,078	641	2,273	2,533	2,178	2,109	4,806	2,354	1,935	2,965	1,637	26,773
<i>Menippe</i> spp.	5	11	5	6	13	5	9	21	33	90	114	50	362
<i>Menticirrhus americanus</i>	57	31	8	33	14	97	34	188	705	91	148	17	1,423
<i>Menticirrhus littoralis</i>	.	.	.	.	.	.	5	.	.	.	.	.	5
<i>Menticirrhus saxatilis</i>	1	2	1	1	13	2	.	1	.	.	1	2	24

Appendix CH07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=1,716
<i>Menticirrhus</i> sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Microgobius gulosus</i>	47	295	326	245	642	642	297	1,159	632	564	481	428	5,758
<i>Microgobius thalassinus</i>	.	.	.	1	.	.	.	.	2	3	4	.	10
<i>Microphis brachyurus</i>	1	.	2	.	1	.	.	.	.	.	.	.	4
<i>Monacanthus ciliatus</i>	.	.	.	.	.	.	1	3	.	.	1	.	5
<i>Mugil cephalus</i>	112	83	379	90	57	64	25	12	7	2	21	46	898
<i>Mugil curema</i>	5	.	4	2	545	32	7	11	27	5	12	9	659
<i>Mugil gyrans</i>	5	26	152	42	827	28	3	27	4	9	62	70	1,255
<i>Mullus auratus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Mycteroperca microlepis</i>	1	.	.	10	3	2	13	25	68	59	41	6	228
<i>Nicholsina usta</i>	9	16	63	616	367	555	127	96	34	24	15	24	1,946
<i>Ocyurus chrysurus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Ogcocephalus cubifrons</i>	1	.	.	.	.	.	.	.	.	1	1	.	3
<i>Oligoplites saurus</i>	1	.	3	3	9	134	134	116	64	26	29	1	520
<i>Opisthonema oglinum</i>	.	6	3	135	36	104	114	13	24	696	23	16	1,170
<i>Opistognathus robinsi</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Opsanus beta</i>	6	8	6	8	22	29	73	33	17	29	23	14	268
<i>Oreochromis aureus</i>	1	.	1	1	.	.	1	113	2	.	.	.	119
<i>Orthopristis chrysoptera</i>	2	8	66	135	169	299	387	588	325	535	134	162	2,810
<i>Parablennius marmoratus</i>	.	.	.	.	.	.	.	.	.	2	.	.	2
<i>Paraclinus marmoratus</i>	.	.	.	.	1	.	.	2	.	.	1	.	4
<i>Paralichthys albigutta</i>	5	7	8	5	18	9	14	11	13	28	11	10	139
<i>Poecilia latipinna</i>	32	31	143	11	54	4	181	2	58	137	.	73	726
<i>Pogonias cromis</i>	.	1	.	2	6	.	2	2	1	1	5	.	20
<i>Pomatomus saltatrix</i>	.	.	.	.	1	.	.	.	.	.	1	1	3
<i>Portunus</i> spp.	642	248	91	194	227	1,158	219	798	454	38	690	418	5,177

Appendix CH07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143		E=1,716
<i>Prionotus rubio</i>	1	1	.	.	.	.	.	.	.	.	.	.	2
<i>Prionotus scitulus</i>	125	46	35	45	60	129	95	181	138	75	266	89	1,284
<i>Prionotus tribulus</i>	16	28	8	16	10	1	3	4	3	1	9	16	115
<i>Pristis pectinata</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Pseudemys peninsularis</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Rachycentron canadum</i>	.	.	3	1	.	.	1	.	.	.	.	.	5
<i>Rhinobatos lentiginosus</i>	1	.	.	.	.	.	.	.	.	.	.	.	1
<i>Rhinoptera bonasus</i>	1	2	5	1	16	11	2	27	.	.	1	.	66
<i>Rimapenaeus constrictus</i>	5	2	.	.	.	.	.	.	.	.	.	.	7
<i>Sardinella aurita</i>	.	.	.	.	.	.	67	.	.	.	.	.	67
<i>Sciaenops ocellatus</i>	90	15	29	22	10	18	8	20	6	37	172	48	475
<i>Scomberomorus maculatus</i>	.	.	1	.	2	.	3	1	.	1	5	5	18
<i>Scorpaena brasiliensis</i>	1	.	.	3	.	.	.	.	.	.	3	1	8
<i>Selene vomer</i>	.	.	.	.	.	.	.	5	1	2	9	7	24
<i>Serranus subligarius</i>	.	6	.	6	.	1	.	1	.	.	.	.	14
<i>Sicyonia laevigata</i>	.	12	.	.	.	.	.	.	.	1	.	.	13
<i>Sicyonia parri</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Sicyonia spp.</i>	6	.	1	1	.	.	2	.	.	.	.	.	10
<i>Sphoeroides nephelus</i>	122	73	53	170	205	80	65	64	55	146	77	68	1,178
<i>Sphoeroides spengleri</i>	.	.	.	.	.	.	.	.	.	.	.	1	1
<i>Sphyraena barracuda</i>	1	.	.	.	2	.	3	2	12	8	11	21	60
<i>Sphyraena borealis</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Sphyrna tiburo</i>	.	.	.	4	.	.	.	.	.	.	1	.	5
<i>Stephanolepis hispidus</i>	69	17	10	56	97	278	451	231	13	30	50	73	1,375
<i>Strongylura marina</i>	6	1	4	1	3	8	.	.	2	3	8	17	53
<i>Strongylura notata</i>	17	43	39	49	74	98	129	102	72	36	39	24	722

Appendix CH07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143	E=143		E=1,716
<i>Strongylura</i> spp.	.	.	1	6	18	3	6	4	4	1	.	.	43
<i>Strongylura timucu</i>	.	2	2	.	2	9	8	.	.	1	.	.	24
<i>Symphurus plagiusa</i>	4	2	.	3	5	.	1	61	11	20	12	8	127
<i>Syngnathus floridae</i>	20	7	7	49	7	38	50	19	13	4	8	8	230
<i>Syngnathus louisianae</i>	33	10	17	28	22	36	24	22	12	11	35	38	288
<i>Syngnathus scovelli</i>	113	102	156	161	122	136	74	30	20	25	45	49	1,033
<i>Synodus foetens</i>	138	88	68	92	144	130	88	59	44	53	97	97	1,098
<i>Tilapia mariae</i>	9	7	17	.	12	.	.	1	3	1	.	118	168
<i>Trachinotus carolinus</i>	4	7	5	.	1	1	1	.	1	2	.	1	23
<i>Trachinotus falcatus</i>	83	27	1	.	1	.	5	2	.	2	4	.	125
<i>Trinectes maculatus</i>	101	317	543	272	224	97	118	1,843	244	144	73	228	4,204
<i>Urophycis floridana</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
Totals	17,754	40,774	31,599	31,229	34,458	73,342	86,468	74,105	39,440	67,376	116,755	70,493	683,793

Appendix CH07-02.

Summary by gear, stratum, and zone of species collected during Charlotte Harbor stratified-random sampling, 2007. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 183-m purse seine was post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=187	E=89	E=276	E=215	E=157	E=205	E=71	E=516	
<i>Acanthostracion quadricornis</i>	.	.	1	.	.	4	9	101	115
<i>Achirus lineatus</i>	1	6	59	13	26	.	.	77	182
<i>Adinia xenica</i>	.	.	10	2	45	.	.	.	57
<i>Aetobatus narinari</i>	.	.	.	.	.	2	1	.	3
<i>Albula vulpes</i>	1	5	1	.	.	.	.	.	7
<i>Aluterus schoepfii</i>	.	.	.	.	.	.	3	47	50
<i>Anarchopterus criniger</i>	.	.	.	.	.	.	.	4	4
<i>Anchoa hepsetus</i>	2	5	183	40	17	.	.	1	248
<i>Anchoa mitchilli</i>	13,661	2,589	91,162	92,716	143,674	.	.	10,311	354,113
<i>Ancylopsetta quadrocellata</i>	.	.	.	.	.	.	.	11	11
<i>Archosargus probatocephalus</i>	26	4	85	7	10	421	147	2	702
<i>Argopecten irradians</i>	.	.	.	.	.	.	.	1	1
<i>Ariopsis felis</i>	6	11	1	55	2	811	116	380	1,382
<i>Astroscopus y-graecum</i>	.	.	.	.	.	.	.	1	1
<i>Bagre marinus</i>	.	.	.	.	.	29	1	31	61
<i>Bairdiella chrysoura</i>	250	8	568	49	71	278	391	161	1,776
<i>Bathygobius soporator</i>	.	.	2	7	2	.	.	.	11
<i>Brevoortia</i> spp.	.	.	10	1	8	16	1	.	36
<i>Calamus arctifrons</i>	5	8	4	.	.	5	1	20	43
<i>Calamus nodosus</i>	.	.	.	.	.	.	.	2	2
<i>Calamus</i> spp.	.	.	.	.	.	.	.	7	7
<i>Callinectes ornatus</i>	3	13	3	1	.	1	30	129	180
<i>Callinectes sapidus</i>	50	87	264	79	59	154	158	1,356	2,207
<i>Callinectes</i> sp.	.	.	1	.	.	.	.	.	1
<i>Caranx hippos</i>	.	.	.	.	.	59	7	.	66

Appendix CH07-02. (Continued)

Species	Gear and Strata								Totals E=1,716
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=187	E=89	E=276	E=215	E=157	E=205	E=71	E=516	
<i>Centropomus undecimalis</i>	.	.	8	35	12	753	107	.	915
<i>Centropristis striata</i>	3	.	.	.	.	.	.	3	6
<i>Chaetodipterus faber</i>	.	2	2	.	1	225	17	130	377
<i>Chasmodes saburrae</i>	59	10	49	1	.	.	.	12	131
<i>Chelonia mydas</i>	.	.	.	.	.	1	2	.	3
<i>Chilomycterus schoepfii</i>	20	2	3	.	1	127	172	519	844
<i>Chloroscombrus chrysurus</i>	.	4	26	.	10	.	1	43	84
<i>Cichlasoma urophthalmus</i>	1	.	.	51	121	.	.	.	173
<i>Citharichthys macrops</i>	.	7	.	.	.	1	4	97	109
<i>Cynoscion arenarius</i>	.	1	7	19	18	34	.	863	942
<i>Cynoscion nebulosus</i>	188	17	171	15	23	70	20	17	521
<i>Cyprinodon variegatus</i>	1	1	1,410	3	140	.	.	.	1,555
<i>Dasyatis americana</i>	.	.	.	.	.	17	4	2	23
<i>Dasyatis sabina</i>	1	3	15	9	2	81	25	33	169
<i>Dasyatis say</i>	.	1	2	.	.	17	6	.	26
<i>Diodon holocanthus</i>	.	.	.	.	.	1	.	.	1
<i>Diplectrum formosum</i>	1	.	.	.	.	.	1	86	88
<i>Diplodus holbrookii</i>	.	.	1	.	.	1	1	.	3
<i>Echeneis neucratoides</i>	.	.	.	.	.	1	1	1	3
<i>Elops saurus</i>	.	1	2	62	16	530	170	.	781
<i>Epinephelus itajara</i>	.	.	.	1	.	6	5	7	19
<i>Epinephelus morio</i>	.	.	.	.	.	9	2	5	16
<i>Etheostoma fusiforme</i>	.	.	.	4	.	.	.	.	4
<i>Etropus crossotus</i>	.	.	.	.	.	.	1	14	15
<i>Eucinostomus gula</i>	2,617	287	6,301	1,134	1,299	9,526	2,328	3,197	26,689
<i>Eucinostomus harengulus</i>	49	188	1,777	2,843	1,705	1,646	139	139	8,486
<i>Eucinostomus jonesii</i>	.	.	.	1	.	.	.	.	1
<i>Eucinostomus spp.</i>	6,563	2,351	28,714	6,105	5,477	.	.	1,021	50,231
<i>Eugerres plumieri</i>	1	1	45	91	164	84	2	15	403
<i>Farfantepenaeus duorarum</i>	996	278	1,360	171	110	69	14	1,901	4,899
<i>Floridichthys carpio</i>	561	9	3,528	.	154	6	6	.	4,264
<i>Fundulus confluentus</i>	.	.	.	1	.	.	.	.	1

Appendix CH07-02. (Continued)

Species	Gear and Strata								Totals E=1,716
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=187	E=89	E=276	E=215	E=157	E=205	E=71	E=516	
<i>Fundulus grandis</i>	3	.	372	56	86	20	.	.	537
<i>Fundulus seminolis</i>	.	.	.	10	12	.	.	.	22
<i>Fundulus similis</i>	.	1	1,026	74	78	1	1	.	1,181
<i>Gambusia holbrooki</i>	.	.	5	2,253	1,066	.	.	.	3,324
<i>Ginglymostoma cirratum</i>	.	.	.	.	.	1	.	.	1
<i>Gobiesox strumosus</i>	1	2	6	3	3	.	.	5	20
<i>Gobiosoma bosc</i>	.	1	1	219	118	.	.	4	343
<i>Gobiosoma longipala</i>	.	.	.	.	.	.	.	49	49
<i>Gobiosoma robustum</i>	325	147	791	11	17	.	.	187	1,478
<i>Gobiosoma spp.</i>	404	72	321	140	132	.	.	65	1,134
<i>Gymnura micrura</i>	.	.	.	.	.	.	.	4	4
<i>Haemulon plumierii</i>	6	.	.	.	.	1	11	8	26
<i>Halichoeres bivittatus</i>	1	.	1	.	.	.	.	1	3
<i>Harengula jaguana</i>	1,030	69	7,880	1,189	6,636	518	170	38	17,530
<i>Hemichromis letourneuxi</i>	.	.	.	.	4	.	.	.	4
<i>Hippocampus erectus</i>	8	.	4	1	1	5	1	211	231
<i>Hippocampus zosterae</i>	26	.	27	.	.	.	.	5	58
<i>Hypoatherina harringtonensis</i>	4	1	.	.	.	.	.	.	5
<i>Hyporhamphus meeki</i>	29	6	2	.	.	.	13	.	50
<i>Hyporhamphus sp.</i>	.	1	.	.	.	.	.	.	1
<i>Hyporhamphus unifasciatus</i>	.	.	.	.	.	.	1	.	1
<i>Hypsoblennius hentz</i>	2	.	1	.	.	.	.	4	7
<i>Jordanella floridae</i>	.	.	.	1	.	.	.	.	1
<i>Labidesthes sicculus</i>	.	.	.	22	.	.	.	.	22
<i>Lactophrys trigonus</i>	.	.	.	.	.	.	.	1	1
<i>Lagodon rhomboides</i>	20,454	298	12,085	316	166	31,944	11,525	9,182	85,970
<i>Leiostomus xanthurus</i>	3	.	80	17	12	83	1	16	212
<i>Lepisosteus osseus</i>	.	.	.	.	.	2	10	7	19
<i>Lepisosteus platyrhincus</i>	.	.	.	.	6	.	.	.	6
<i>Lepomis macrochirus</i>	.	.	.	21	17	.	.	.	38
<i>Limulus polyphemus</i>	1	.	4	.	1	7	13	1	27
<i>Lophogobius cyprinoides</i>	.	.	8	110	1,634	.	.	7	1,759

Appendix CH07-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=187	E=89	E=276	E=215	E=157	E=205	E=71	E=516	
<i>Lucania goodei</i>	.	.	.	15	8	.	.	.	23
<i>Lucania parva</i>	16,984	66	22,652	120	164	.	.	4	39,990
<i>Lutjanus griseus</i>	94	1	118	10	2	922	623	146	1,916
<i>Lutjanus synagris</i>	65	30	16	2	4	115	63	410	705
<i>Malaclemys terrapin</i>	.	.	.	.	.	4	.	.	4
<i>Megalops atlanticus</i>	.	.	.	.	.	2	.	.	2
<i>Membras martinica</i>	.	2	102	613	138	.	.	.	855
<i>Menidia</i> spp.	70	178	8,106	10,961	7,457	.	.	1	26,773
<i>Menippe</i> spp.	2	.	.	.	.	4	.	356	362
<i>Menticirrhus americanus</i>	7	4	47	42	73	2	.	1,248	1,423
<i>Menticirrhus littoralis</i>	.	.	5	.	.	.	.	.	5
<i>Menticirrhus saxatilis</i>	1	5	13	2	1	.	.	2	24
<i>Menticirrhus</i> sp.	.	.	.	.	.	.	.	1	1
<i>Microgobius gulosus</i>	1,210	165	1,833	867	1,646	.	.	37	5,758
<i>Microgobius thalassinus</i>	.	.	.	1	.	.	.	9	10
<i>Microphis brachyurus</i>	.	.	.	3	1	.	.	.	4
<i>Monacanthus ciliatus</i>	.	.	.	.	.	1	.	4	5
<i>Mugil cephalus</i>	3	.	139	466	97	144	49	.	898
<i>Mugil curema</i>	1	.	583	4	4	45	22	.	659
<i>Mugil gyrans</i>	.	1	909	140	27	169	9	.	1,255
<i>Mullus auratus</i>	.	.	.	.	.	.	.	1	1
<i>Mycteroperca microlepis</i>	16	.	1	.	.	113	78	20	228
<i>Nicholsina usta</i>	43	.	62	.	.	229	1,088	524	1,946
<i>Ocyurus chrysurus</i>	.	.	.	.	.	1	.	.	1
<i>Ogcocephalus cubifrons</i>	.	.	.	.	.	.	.	3	3
<i>Oligoplites saurus</i>	9	7	112	82	234	45	30	1	520
<i>Opisthonema oglinum</i>	75	30	63	25	721	184	55	17	1,170
<i>Opistognathus robbinsi</i>	.	.	.	.	.	.	.	1	1
<i>Opsanus beta</i>	1	9	18	3	1	66	23	147	268
<i>Oreochromis aureus</i>	.	.	.	3	114	1	.	1	119
<i>Orthopristis chrysoptera</i>	295	2	105	3	.	573	805	1,027	2,810
<i>Parablennius marmoratus</i>	.	.	.	.	.	.	.	2	2

Appendix CH07-02. (Continued)

Species	Gear and Strata								Totals E=1,716
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl E=516	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=187	E=89	E=276	E=215	E=157	E=205	E=71		
<i>Paraclinus marmoratus</i>	2	.	1	.	.	.	.	1	4
<i>Paralichthys albigutta</i>	3	7	.	.	.	46	29	54	139
<i>Poecilia latipinna</i>	2	.	127	209	387	1	.	.	726
<i>Pogonias cromis</i>	.	.	.	6	1	13	.	.	20
<i>Pomatomus saltatrix</i>	1	.	.	.	.	2	.	.	3
<i>Portunus</i> spp.	16	14	6	.	1	5	4	5,131	5,177
<i>Prionotus rubio</i>	.	.	.	.	.	.	.	2	2
<i>Prionotus scitulus</i>	11	10	13	.	3	6	15	1,226	1,284
<i>Prionotus tribulus</i>	1	3	8	.	1	16	1	85	115
<i>Pristis pectinata</i>	.	.	.	1	.	.	.	.	1
<i>Pseudemys peninsularis</i>	.	.	.	1	.	.	.	.	1
<i>Rachycentron canadum</i>	.	.	.	.	.	1	3	1	5
<i>Rhinobatos lentiginosus</i>	.	.	.	.	.	.	.	1	1
<i>Rhinoptera bonasus</i>	.	.	.	.	.	30	35	1	66
<i>Rimapenaeus constrictus</i>	.	.	.	.	.	.	.	7	7
<i>Sardinella aurita</i>	67	.	.	.	.	.	.	.	67
<i>Sciaenops ocellatus</i>	4	2	204	51	13	191	10	.	475
<i>Scomberomorus maculatus</i>	.	.	.	.	.	6	12	.	18
<i>Scorpaena brasiliensis</i>	.	.	.	.	.	.	2	6	8
<i>Selene vomer</i>	.	.	.	.	.	20	3	1	24
<i>Serranus subligarius</i>	6	.	.	.	.	.	.	8	14
<i>Sicyonia laevigata</i>	.	.	.	.	.	.	.	13	13
<i>Sicyonia parri</i>	.	.	.	.	.	.	.	1	1
<i>Sicyonia</i> spp.	.	.	.	.	.	.	.	10	10
<i>Sphoeroides nephelus</i>	177	51	195	4	15	295	170	271	1,178
<i>Sphoeroides spengleri</i>	1	.	.	.	.	.	.	.	1
<i>Sphyraena barracuda</i>	1	.	4	.	.	51	4	.	60
<i>Sphyraena borealis</i>	.	.	.	.	.	1	.	.	1
<i>Sphyrna tiburo</i>	.	.	.	.	.	1	4	.	5
<i>Stephanolepis hispidus</i>	148	.	72	1	1	44	94	1,015	1,375
<i>Strongylura marina</i>	2	.	2	4	4	5	36	.	53
<i>Strongylura notata</i>	22	5	329	68	40	236	22	.	722

Appendix CH07-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=187	E=89	E=276	E=215	E=157	E=205	E=71	E=516	
<i>Strongylura</i> spp.	1	.	22	13	7	.	.	.	43
<i>Strongylura timucu</i>	.	.	3	8	9	2	2	.	24
<i>Symphurus plagiusa</i>	3	2	11	.	3	3	.	105	127
<i>Syngnathus floridae</i>	58	2	15	.	.	1	.	154	230
<i>Syngnathus louisianae</i>	65	14	53	5	.	.	.	151	288
<i>Syngnathus scovelli</i>	458	47	340	22	14	.	.	152	1,033
<i>Synodus foetens</i>	109	64	139	37	23	134	142	450	1,098
<i>Tilapia mariae</i>	.	.	.	9	159	.	.	.	168
<i>Trachinotus carolinus</i>	.	.	.	.	.	9	14	.	23
<i>Trachinotus falcatus</i>	.	.	38	.	.	84	3	.	125
<i>Trinectes maculatus</i>	.	1	3	1,226	2,085	5	3	881	4,204
<i>Urophycis floridana</i>	.	.	.	.	.	.	.	1	1
Totals	67,397	7,219	194,858	122,986	176,614	51,395	19,092	44,232	683,793

Appendix CH07-03. Summary by zone of species collected during Charlotte Harbor stratified-random sampling, 2007. Zones A-E and G were located in Charlotte Harbor, while Zones H (Caloosahatchee River), M (Myakka River), and P (Peace River) represent tributaries of Charlotte Harbor. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Zone									Totals
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84		E=1,716
<i>Acanthostracion quadricornis</i>	3	27	24	37	16	8	.	.	.	115
<i>Achirus lineatus</i>	37	21	20	28	30	7	6	.	33	182
<i>Adinia xenica</i>	.	.	.	10	.	.	.	.	47	57
<i>Aetobatus narinari</i>	.	.	3	.	.	.	.	.	.	3
<i>Albula vulpes</i>	.	5	.	1	1	.	.	.	.	7
<i>Aluterus schoepfii</i>	1	25	12	7	3	2	.	.	.	50
<i>Anarchopterus criniger</i>	1	.	1	2	.	.	.	.	.	4
<i>Anchoa hepsetus</i>	17	85	80	3	6	.	18	.	39	248
<i>Anchoa mitchilli</i>	25,448	1,483	13,290	2,864	2,613	62,890	141,214	31,450	72,861	354,113
<i>Ancylosetta quadrocellata</i>	.	.	.	1	5	5	.	.	.	11
<i>Archosargus probatocephalus</i>	53	158	31	135	98	210	9	3	5	702
<i>Argopecten irradians</i>	.	.	.	1	.	.	.	.	.	1
<i>Ariopsis felis</i>	162	332	272	63	113	65	322	27	26	1,382
<i>Astroscopus y-graecum</i>	.	.	.	.	.	1	.	.	.	1
<i>Bagre marinus</i>	11	13	7	.	3	.	11	5	11	61
<i>Bairdiella chrysoura</i>	352	219	176	575	160	51	177	19	47	1,776
<i>Bathygobius soporator</i>	2	.	.	.	.	.	4	1	4	11
<i>Brevoortia</i> spp.	2	10	.	1	14	.	6	2	1	36
<i>Calamus arctifrons</i>	1	10	17	9	4	2	.	.	.	43
<i>Calamus nodosus</i>	.	2	.	.	.	.	.	.	.	2

Appendix CH07-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84		E=1,716
<i>Calamus</i> spp.	.	3	.	.	4	.	.	.	.	7
<i>Callinectes ornatus</i>	8	77	14	16	19	34	12	.	.	180
<i>Callinectes sapidus</i>	576	153	173	290	183	293	244	134	161	2,207
<i>Callinectes</i> sp.	.	.	.	.	.	1	.	.	.	1
<i>Caranx hippos</i>	9	9	3	9	18	18	.	.	.	66
<i>Centropomus undecimalis</i>	77	322	107	205	33	124	32	2	13	915
<i>Centropristis striata</i>	.	6	.	.	.	.	.	.	.	6
<i>Chaetodipterus faber</i>	113	50	33	23	43	96	2	6	11	377
<i>Chasmodes saburrae</i>	17	32	48	7	8	18	1	.	.	131
<i>Chelonia mydas</i>	.	.	.	1	1	1	.	.	.	3
<i>Chilomycterus schoepfii</i>	42	317	139	205	74	57	5	.	5	844
<i>Chloroscombrus chrysurus</i>	22	1	1	2	5	28	9	10	6	84
<i>Cichlasoma urophthalmus</i>	.	.	1	.	.	.	172	.	.	173
<i>Citharichthys macrops</i>	.	72	11	23	2	1	.	.	.	109
<i>Cynoscion arenarius</i>	243	.	4	.	.	34	134	252	275	942
<i>Cynoscion nebulosus</i>	98	70	95	60	83	71	22	11	11	521
<i>Cyprinodon variegatus</i>	5	6	112	1,161	2	126	134	7	2	1,555
<i>Dasyatis americana</i>	1	7	2	6	1	6	.	.	.	23
<i>Dasyatis sabina</i>	54	17	38	8	15	9	13	9	6	169
<i>Dasyatis say</i>	2	5	7	4	1	7	.	.	.	26
<i>Diodon holocanthus</i>	.	1	.	.	.	.	.	.	.	1
<i>Diplectrum formosum</i>	2	32	23	16	13	2	.	.	.	88
<i>Diplodus holbrookii</i>	.	3	.	.	.	.	.	.	.	3

Appendix CH07-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84	
<i>Echeneis neucratoides</i>	1	.	2	3
<i>Elops saurus</i>	35	75	114	60	319	100	77	.	1	781
<i>Epinephelus itajara</i>	.	2	3	3	3	.	5	1	2	19
<i>Epinephelus morio</i>	.	11	.	2	2	1	.	.	.	16
<i>Etheostoma fusiforme</i>	.	.	.	.	.	.	4	.	.	4
<i>Etropus crossotus</i>	.	4	.	4	3	3	1	.	.	15
<i>Eucinostomus gula</i>	1,914	7,301	2,448	5,281	3,275	3,731	1,965	524	250	26,689
<i>Eucinostomus harengulus</i>	752	587	691	808	410	657	3,780	394	407	8,486
<i>Eucinostomus jonesii</i>	.	.	.	.	.	.	1	.	.	1
<i>Eucinostomus spp.</i>	2,420	7,251	5,222	14,703	4,172	4,787	9,466	1,117	1,093	50,231
<i>Eugerres plumieri</i>	83	22	22	1	2	3	190	14	66	403
<i>Farfantepenaeus duorarum</i>	1,391	316	360	443	634	584	401	286	484	4,899
<i>Floridichthys carpio</i>	28	334	1,247	2,058	74	369	154	.	.	4,264
<i>Fundulus confluentus</i>	.	.	.	.	.	.	1	.	.	1
<i>Fundulus grandis</i>	88	49	37	192	25	4	5	9	128	537
<i>Fundulus seminolis</i>	.	.	.	.	.	.	22	.	.	22
<i>Fundulus similis</i>	7	23	251	29	2	717	21	68	63	1,181
<i>Gambusia holbrooki</i>	1	.	.	4	.	.	3,274	.	45	3,324
<i>Ginglymostoma cirratum</i>	.	.	.	1	.	.	.	.	.	1
<i>Gobiesox strumosus</i>	8	.	1	.	.	1	5	2	3	20
<i>Gobiosoma bosc</i>	2	.	.	.	.	.	319	8	14	343
<i>Gobiosoma longipala</i>	.	31	2	4	1	11	.	.	.	49
<i>Gobiosoma robustum</i>	69	200	200	276	133	567	31	.	2	1,478

Appendix CH07-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84		E=1,716
<i>Gobiosoma</i> spp.	76	44	103	37	53	536	264	9	12	1,134
<i>Gymnura micrura</i>	.	2	.	1	.	.	.	.	1	4
<i>Haemulon plumierii</i>	.	21	.	3	2	.	.	.	.	26
<i>Halichoeres bivittatus</i>	.	3	.	.	.	.	.	.	.	3
<i>Harengula jaguana</i>	236	1,224	510	1,484	599	5,650	7,824	3	.	17,530
<i>Hemichromis letourneuxi</i>	.	.	.	.	.	.	4	.	.	4
<i>Hippocampus erectus</i>	5	57	23	61	45	30	5	.	5	231
<i>Hippocampus zosterae</i>	2	8	14	14	7	13	.	.	.	58
<i>Hypoatherina harringtonensis</i>	.	1	1	3	.	.	.	.	.	5
<i>Hyporhamphus meeki</i>	.	3	29	15	3	.	.	.	.	50
<i>Hyporhamphus</i> sp.	.	.	.	.	1	.	.	.	.	1
<i>Hyporhamphus unifasciatus</i>	.	.	1	.	.	.	.	.	.	1
<i>Hypsoblennius hentz</i>	1	1	4	.	.	1	.	.	.	7
<i>Jordanella floridae</i>	.	.	.	.	.	.	1	.	.	1
<i>Labidesthes sicculus</i>	.	.	.	.	.	.	22	.	.	22
<i>Lactophrys trigonus</i>	.	.	.	1	.	.	.	.	.	1
<i>Lagodon rhomboides</i>	2,734	31,821	12,962	23,503	10,880	3,522	464	40	44	85,970
<i>Leiostomus xanthurus</i>	11	59	11	82	12	4	29	2	2	212
<i>Lepisosteus osseus</i>	8	7	.	.	.	.	.	2	2	19
<i>Lepisosteus platyrhincus</i>	.	.	.	.	.	.	6	.	.	6
<i>Lepomis macrochirus</i>	.	.	.	.	.	.	38	.	.	38
<i>Limulus polyphemus</i>	21	1	2	1	.	.	.	1	1	27
<i>Lophogobius cyprinoides</i>	.	.	7	.	1	.	1,751	.	.	1,759

Appendix CH07-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84		E=1,716
<i>Lucania goodei</i>	.	.	.	.	.	.	23	.	.	23
<i>Lucania parva</i>	945	10,909	4,892	13,571	3,035	6,353	270	3	12	39,990
<i>Lutjanus griseus</i>	29	324	155	1,008	274	101	14	5	6	1,916
<i>Lutjanus synagris</i>	123	137	52	208	59	107	2	5	12	705
<i>Malaclemys terrapin</i>	2	1	1	.	.	.	.	.	.	4
<i>Megalops atlanticus</i>	.	.	1	.	.	1	.	.	.	2
<i>Membras martinica</i>	5	1	98	.	.	.	614	74	63	855
<i>Menidia</i> spp.	640	2,275	1,099	3,721	152	467	16,496	839	1,084	26,773
<i>Menippe</i> spp.	7	55	52	218	16	11	3	.	.	362
<i>Menticirrhus americanus</i>	855	3	11	5	6	1	187	87	268	1,423
<i>Menticirrhus littoralis</i>	.	.	.	5	.	.	.	.	.	5
<i>Menticirrhus saxatilis</i>	11	7	1	.	1	1	2	.	1	24
<i>Menticirrhus</i> sp.	.	.	.	.	1	.	.	.	.	1
<i>Microgobius gulosus</i>	698	319	689	154	99	1,250	2,422	59	68	5,758
<i>Microgobius thalassinus</i>	4	.	.	.	.	.	3	2	1	10
<i>Microphis brachyurus</i>	.	.	.	.	.	.	4	.	.	4
<i>Monacanthus ciliatus</i>	1	4	.	.	.	.	.	.	.	5
<i>Mugil cephalus</i>	85	148	23	44	23	12	488	3	72	898
<i>Mugil curema</i>	11	36	3	11	47	543	8	.	.	659
<i>Mugil gyrans</i>	29	89	38	49	41	842	138	6	23	1,255
<i>Mullus auratus</i>	.	1	.	.	.	.	.	.	.	1
<i>Mycteroperca microlepis</i>	.	135	7	68	14	4	.	.	.	228
<i>Nicholsina usta</i>	.	885	22	966	70	3	.	.	.	1,946

Appendix CH07-03. (Continued)

Species	Zone									Totals E=1,716
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84	
<i>Ocyurus chrysurus</i>	.	1	.	.	.	.	.	.	.	1
<i>Ogcocephalus cubifrons</i>	.	1	.	1	.	1	.	.	.	3
<i>Oligoplites saurus</i>	62	18	28	35	35	25	276	26	15	520
<i>Opisthonema oglinum</i>	22	34	77	76	196	15	701	38	11	1,170
<i>Opistognathus robinsi</i>	.	1	.	.	.	.	.	.	.	1
<i>Opsanus beta</i>	7	44	26	110	36	37	7	1	.	268
<i>Oreochromis aureus</i>	1	.	.	.	.	.	118	.	.	119
<i>Orthopristis chrysoptera</i>	90	1,297	155	610	338	304	9	6	1	2,810
<i>Parablennius marmoreus</i>	.	.	.	2	.	.	.	.	.	2
<i>Paraclinus marmoratus</i>	.	3	.	1	.	.	.	.	.	4
<i>Paralichthys albigutta</i>	15	50	25	23	11	13	2	.	.	139
<i>Poecilia latipinna</i>	2	5	10	112	.	1	581	11	4	726
<i>Pogonias cromis</i>	.	4	.	5	.	4	7	.	.	20
<i>Pomatomus saltatrix</i>	.	2	.	1	.	.	.	.	.	3
<i>Portunus</i> spp.	236	1,291	2,718	564	278	74	16	.	.	5,177
<i>Prionotus rubio</i>	1	.	.	.	1	.	.	.	.	2
<i>Prionotus scitulus</i>	229	406	281	104	153	73	17	7	14	1,284
<i>Prionotus tribulus</i>	47	16	11	2	11	9	3	4	12	115
<i>Pristis pectinata</i>	.	.	.	.	.	.	.	.	1	1
<i>Pseudemys peninsularis</i>	.	.	.	.	.	.	1	.	.	1
<i>Rachycentron canadum</i>	2	.	.	.	.	3	.	.	.	5
<i>Rhinobatos lentiginosus</i>	.	.	1	.	.	.	.	.	.	1
<i>Rhinoptera bonasus</i>	31	.	29	.	1	4	.	1	.	66

Appendix CH07-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84		E=1,716
<i>Rimapenaeus constrictus</i>	2	.	5	.	.	.	.	.	.	7
<i>Sardinella aurita</i>	.	.	.	67	.	.	.	.	.	67
<i>Sciaenops ocellatus</i>	48	50	146	71	35	61	31	12	21	475
<i>Scomberomorus maculatus</i>	.	.	.	2	12	4	.	.	.	18
<i>Scorpaena brasiliensis</i>	.	2	2	4	.	.	.	.	.	8
<i>Selene vomer</i>	.	3	.	8	6	7	.	.	.	24
<i>Serranus subligarius</i>	.	12	.	1	1	.	.	.	.	14
<i>Sicyonia laevigata</i>	.	12	1	.	.	.	.	.	.	13
<i>Sicyonia parri</i>	.	.	.	1	.	.	.	.	.	1
<i>Sicyonia spp.</i>	.	1	.	9	.	.	.	.	.	10
<i>Sphoeroides nephelus</i>	105	261	218	267	147	152	19	4	5	1,178
<i>Sphoeroides spengleri</i>	.	.	1	.	.	.	.	.	.	1
<i>Sphyraena barracuda</i>	.	37	3	17	1	2	.	.	.	60
<i>Sphyraena borealis</i>	.	.	.	.	1	.	.	.	.	1
<i>Sphyrna tiburo</i>	.	.	4	.	.	1	.	.	.	5
<i>Stephanolepis hispidus</i>	16	692	123	367	132	39	6	.	.	1,375
<i>Strongylura marina</i>	3	1	6	21	12	2	8	.	.	53
<i>Strongylura notata</i>	112	96	152	164	22	68	74	27	7	722
<i>Strongylura spp.</i>	2	9	3	5	2	2	10	4	6	43
<i>Strongylura timucu</i>	.	4	1	2	.	.	13	4	.	24
<i>Symphurus plagiusa</i>	67	2	12	3	6	4	.	4	29	127
<i>Syngnathus floridae</i>	6	104	28	67	16	8	.	.	1	230
<i>Syngnathus louisianae</i>	53	40	55	55	39	33	10	1	2	288

Appendix CH07-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	G	H	M	P	
	E=264	E=217	E=215	E=204	E=144	E=144	E=360	E=84	E=84	E=1,716
<i>Syngnathus scovelli</i>	145	176	264	153	115	129	35	6	10	1,033
<i>Synodus foetens</i>	220	181	155	182	149	118	56	18	19	1,098
<i>Tilapia mariae</i>	.	.	.	.	.	.	168	.	.	168
<i>Trachinotus carolinus</i>	7	2	4	1	3	6	.	.	.	23
<i>Trachinotus falcatus</i>	1	32	2	4	52	34	.	.	.	125
<i>Trinectes maculatus</i>	368	12	31	2	3	5	3,664	22	97	4,204
<i>Urophycis floridana</i>	1	.	.	.	.	.	.	.	.	1
Totals	42,598	73,262	50,732	77,994	29,881	96,392	199,183	35,697	78,054	683,793

Intentionally Left Blank

Northern Indian River Lagoon

The sampling area identified as the northern Indian River Lagoon (IRL) system is a narrow estuary located along the eastern central coast of Florida which extends from the northern terminus of the Indian River Lagoon proper south to Vero Beach. The northern IRL is connected to the Atlantic Ocean by one permanent inlet (Sebastian Inlet) and one intermittently open conduit via the Canaveral Locks that links the Banana River to the Atlantic Ocean just south of Cape Canaveral. Freshwater inflow primarily comes from the St. Sebastian River and from numerous creeks located mainly along the western shoreline (Paperno and Brodie 2004). Shoreline vegetation consists largely of fringing mangrove, Brazilian pepper, and marsh grasses. Bottom substrates are typically characterized as sand or mud mixed with shell hash and occasional oysters. Seagrasses, primarily *Halodule wrightii*, are the dominant vegetative cover in the northern IRL (Steward et al. 2006).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the northern IRL since 1990. The area sampled was divided into six geographically-defined bay zones (A-E, and H) and two riverine zones (F and O; Figure IR07-01). Monthly stratified-random sampling (SRS) was conducted in Zones C, D, and H using 21.3-m bay and 183-m haul seines. Zone H was also sampled monthly with 6.1-m bay otter trawls. Monthly SRS was conducted in Zone E with only 183-m haul seines. Zones F and O were sampled monthly with 21.3-m river seines. Zones A, B, and E were sampled seasonally (October and November) with 21.3-m bay seines. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in the northern IRL.

Stratified-Random Sampling

A total of 449,290 fishes (157 taxa) and selected invertebrates (ten taxa) were collected from 923 northern IRL samples in 2007 (Table IR07-01; Appendices IR07-01, -02, and -03). *Anchoa mitchilli* (n=300,761) was the most numerous species collected, representing 66.9% of the total catch. The four next most abundant taxa, *Lucania parva*

(n=22,217), *Eucinostomus* spp. (n=18,410), *Diapterus auratus* (n=17,822), and *Menidia* spp. (n=14,355) accounted for an additional 16.2% of the total catch. Thirty-five Selected Taxa (n=19,771 animals) composed 4.4% of the total catch. *Mugil curema* (n=3,906) was the most abundant Selected Taxon, representing less than 1.0% of the total catch. *Mugil cephalus* (n=3,289) and *Callinectes sapidus*. (n=1,776) were the next two most abundant Selected Taxa, accounting for an additional 1.1% of the total catch. New taxa collected from the northern IRL included *Canthidermis maculata* (rough triggerfish), *Coryphaena hippurus* (dolphinfish), *Haemulon aurolineatum* (tomtate), *Hemichromis letourneuxi* (jewelfish), *Hirundichthys* sp. (flyingfish), *Noturus* sp. (madtom), *Oreochromis aureus* (blue tilapia), and *Tylosurus acus* (Agujon).

Bay Sampling

21.3-m Bay Seines. A total of 248,932 animals were collected in 380 21.3-m bay seines, representing 55.4% of the overall SRS catch (Table IR07-01). *Anchoa mitchilli* (n=176,164), *L. parva* (n=22,042), and *Menidia* spp. (n=13,377) were the most abundant species, accounting for 85.0% of the animals collected in 21.3-m bay seine catch (Table IR07-02). The taxa most frequently caught in the 21.3-m bay seines were *Microgobius gulosus* (60.5% occurrence), *A. mitchilli* (48.7% occurrence), and *Gobiosoma robustum* (48.4% occurrence).

A total of 4,901 animals from 27 Selected Taxa were collected, representing 2.0% of the entire 21.3-m bay seine catch (Table IR07-03). *Farfantepenaeus* spp. (n=880), *Sciaenops ocellatus* (n=610), and *M. cephalus* (n=570) were the most abundant Selected Taxa, accounting for 42.0% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Cynoscion nebulosus* (27.6% occurrence) and *Farfantepenaeus* spp (23.7% occurrence).

183-m Haul Seines. A total of 34,043 animals were collected in 230 183-m haul seines, representing 7.6% of the overall SRS catch (Table IR07-01). *Lagodon rhomboides* (n=6,409) and *D. auratus* (n=4,936) were the most abundant species, accounting for 33.3% of the 183-m haul seine catch (Table IR07-04). The taxa most frequently caught in the 183-m haul seines were *M. cephalus* (83.9% occurrence), *M. curema* (82.2% occurrence), *Dasyatis sabina* (78.3% occurrence), and *Sphoeroides*

nephelus (73.9% occurrence). A total of 9,339 animals from 32 Selected Taxa were collected, representing 27.4% of the entire 183-m haul seine catch (Table IR07-05). *Mugil curema* (n=2,820) and *M. cephalus* (n=2,626) were the most abundant Selected Taxa, accounting for 58.3% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in the 183-m haul seines were *M. cephalus* (83.9% occurrence) and *M. curema* (82.2% occurrence).

6.1-m Bay Otter Trawls. A total of 6,050 animals were collected in 96 6.1-m bay otter trawls, representing 1.3% of the overall SRS catch (Table IR07-01). *Eucinostomus* spp. (n=1,505) and *C. sapidus* (n=742) were the most abundant species, accounting for 37.1% of the 6.1-m bay otter trawl catch (Table IR07-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Chilomycterus schoepfi* (50.0% occurrence), *Gobiosoma* spp. (47.9% occurrence), *G. robustum* (45.8% occurrence), *Syngnathus scovelli* (44.8% occurrence), and *Eucinostomus* spp. (40.6% occurrence).

A total of 1,153 animals from 18 Selected Taxa were collected, representing 19.1% of the entire 6.1-m bay otter trawl catch (Table IR07-07). *Callinectes sapidus* (n=742) and *Farfantepenaeus* spp. (n=126) were the most abundant Selected Taxa, accounting for 75.3% of the Selected Taxa collected in this gear. The Selected Taxa most frequently caught in the 6.1-m bay otter trawl were *C. sapidus* (38.5% occurrence) and *Farfantepenaeus* spp. (37.5% occurrence).

River Sampling

21.3-m River Seines. A total of 160,265 animals were collected in 217 21.3-m river seines, representing 35.7% of the overall SRS collections (Table IR07-01). *Anchoa mitchilli* (n=123,960) was the most abundant species collected, accounting for 77.3% of the 21.3-m river seine catch (Table IR07-08). The taxa most frequently caught in 21.3-m river seines were *D. auratus* (85.7% occurrence) and *Eucinostomus* spp. (84.3% occurrence).

A total of 4,378 animals from 22 Selected Taxa were collected, representing 2.7% of the entire 21.3-m river seine catch (Table IR07-09). *Centropomus undecimalis* (n=1,280), *M. curema* (n=794), *Farfantepenaeus* spp. (n=702), and *C. sapidus* (n=615) were the most abundant Selected Taxa, accounting for 77.5% of the Selected Taxa

collected in this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *C. undecimalis* (52.5% occurrence), and *C. sapidus* (43.8% occurrence).

References

Paperno, R. and R.B. Brodie. 2004. Effects of environmental variables upon the spatial and temporal structure of a fish community in a small, freshwater tributary of the Indian River Lagoon, Florida. *Estuarine Coastal and Shelf Science* 61/2:229-241.

Steward, J.S., R.W. Virnstein, M.A. Lasi, L.J. Morris, J.D. Miller, L.M. Hall, and W.A. Tweeddale. 2006. The impacts of the 2004 hurricanes on hydrology, water quality, and seagrass in the central Indian River Lagoon, Florida. *Estuaries and Coasts* 29:954-965.



Figure IR07-01. Map of the northern Indian River Lagoon sampling area. Zones are labeled A – F, H and O.

Table IR07-01. Summary of catch and effort data for northern Indian River Lagoon stratified-random sampling, 2007.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	4,830	16	.	.	.	.	.	.	4,830	16
B	4,650	14	.	.	.	.	.	.	4,650	14
C	128,905	120	.	.	6,797	50	.	.	135,702	170
D	36,041	96	.	.	8,337	72	.	.	44,378	168
E	12,343	14	.	.	4,081	48	.	.	16,424	62
F	.	.	139,422	168	.	.	.	.	139,422	168
H	62,163	120	.	.	14,828	60	6,050	96	83,041	276
O	.	.	20,843	49	.	.	.	.	20,843	49
Totals	248,932	380	160,265	217	34,043	230	6,050	96	449,290	923

Table IR07-02. Catch statistics for 10 dominant taxa collected in 380 21.3-m bay seine samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	176,164	70.8	48.7	331.14	140.37	826.36	49,900.00	32	0.02	17	62
<i>Lucania parva</i>	22,042	8.9	43.2	41.43	6.17	290.48	1,123.57	25	0.04	12	46
<i>Menidia</i> spp.	13,377	5.4	40.3	25.14	6.59	511.03	1,923.57	38	0.09	14	89
<i>Eucinostomus</i> spp.	5,804	2.3	40.5	10.91	1.72	306.86	243.57	26	0.10	8	39
<i>Microgobius gulosus</i>	5,376	2.2	60.5	10.11	1.25	241.13	255.71	27	0.09	12	55
<i>Floridichthys carpio</i>	3,455	1.4	32.4	6.49	1.14	341.98	213.57	30	0.18	7	61
<i>Diapterus auratus</i>	3,132	1.3	24.7	5.89	1.41	465.35	292.86	36	0.25	10	244
<i>Bairdiella chrysoura</i>	2,370	1.0	26.6	4.45	1.11	485.17	317.14	35	0.40	9	135
<i>Gobiosoma robustum</i>	1,676	0.7	48.4	3.15	0.63	391.32	195.71	23	0.07	20	46
<i>Gobiosoma</i> spp.	1,596	0.6	40.5	3.00	0.52	337.42	137.14	17	0.05	9	19
Subtotal	234,992	94.6	.	.	.	.	.	.	.	7	244
Totals	248,932	100.0	.	467.92	141.14	588.01	50,122.86	.	.	3	583

Table IR07-03. Catch statistics for Selected Taxa collected in 380 21.3-m bay seine samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus</i> spp.	880	0.4	23.7	1.65	0.36	421.49	84.29	9	0.09	3	14
<i>Sciaenops ocellatus</i>	610	0.2	12.4	1.15	0.30	516.47	60.00	31	1.24	12	539
<i>Mugil cephalus</i>	570	0.2	7.1	1.07	0.91	1,653.45	345.00	31	1.66	15	359
<i>Micropogonias undulatus</i>	515	0.2	3.2	0.97	0.58	1,161.37	194.29	24	0.27	10	53
<i>Cynoscion nebulosus</i>	460	0.2	27.6	0.86	0.15	342.03	31.43	36	0.83	14	223
<i>Archosargus probatocephalus</i>	431	0.2	13.9	0.81	0.26	621.89	62.86	41	2.22	11	339
<i>Litopenaeus setiferus</i>	293	0.1	2.6	0.55	0.32	1,138.44	105.71	10	0.27	4	33
<i>Mugil curema</i>	292	0.1	11.1	0.55	0.27	948.04	92.86	40	2.11	16	197
<i>Callinectes sapidus</i>	262	0.1	9.5	0.49	0.16	638.34	35.00	23	1.50	4	172
<i>Menticirrhus americanus</i>	191	0.1	7.6	0.36	0.14	767.28	47.86	34	0.71	12	73
<i>Farfantepenaeus duorarum</i>	156	0.1	11.8	0.29	0.06	429.81	16.43	17	0.16	15	24
<i>Trachinotus falcatus</i>	55	0.0	3.7	0.10	0.05	1,029.22	18.57	27	2.66	11	115
<i>Centropomus undecimalis</i>	40	0.0	4.7	0.08	0.02	616.85	5.71	118	26.73	14	583
<i>Lutjanus griseus</i>	32	0.0	3.4	0.06	0.02	793.69	7.86	55	10.20	11	208
<i>Lutjanus synagris</i>	26	0.0	1.1	0.05	0.04	1,463.89	13.57	39	2.10	19	56
<i>Lutjanus analis</i>	24	0.0	1.8	0.05	0.02	929.03	6.43	43	4.57	16	118
<i>Leiostomus xanthurus</i>	18	0.0	1.1	0.03	0.02	1,079.77	5.00	35	1.75	24	50

Table IR07-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Albula vulpes</i>	16	0.0	2.1	0.03	0.01	890.87	4.29	54	4.70	25	94
<i>Trachinotus carolinus</i>	7	0.0	0.5	0.01	0.01	1,498.29	3.57	19	1.07	15	23
<i>Elops saurus</i>	6	0.0	0.8	0.01	0.01	1,376.59	2.86	84	24.45	32	164
<i>Cynoscion complex</i>	5	0.0	1.3	0.01	0.00	867.17	0.71	40	7.72	18	60
<i>Farfantepenaeus aztecus</i>	4	0.0	0.8	0.01	0.00	1,191.11	1.43	19	2.00	17	25
<i>Pogonias cromis</i>	2	0.0	0.5	0.00	0.00	1,376.59	0.71	214	27.00	187	241
<i>Paralichthys albigutta</i>	2	0.0	0.5	0.00	0.00	1,376.59	0.71	124	103.50	20	227
<i>Farfantepenaeus brasiliensis</i>	1	0.0	0.3	0.00	0.00	1,949.36	0.71	17	.	17	17
<i>Epinephelus itajara</i>	1	0.0	0.3	0.00	0.00	1,949.36	0.71	228	.	228	228
<i>Lutjanus jocu</i>	1	0.0	0.3	0.00	0.00	1,949.36	0.71	76	.	76	76
<i>Scomberomorus maculatus</i>	1	0.0	0.3	0.00	0.00	1,949.36	0.71	50	.	50	50
Totals	4,901	2.0	64.2	9.21	1.53	324.35	382.86	.	.	3	583

Table IR07-04. Catch statistics for 10 dominant taxa collected in 230 183-m haul seine samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	6,409	18.8	36.1	27.87	6.74	366.65	1,213.00	130	0.30	62	219
<i>Diapterus auratus</i>	4,936	14.5	47.8	21.46	3.88	274.02	394.00	104	0.43	50	189
<i>Ariopsis felis</i>	3,158	9.3	69.1	13.73	2.26	249.18	252.00	275	0.99	59	391
<i>Mugil curema</i>	2,820	8.3	82.2	12.26	1.86	230.04	255.00	157	0.75	81	352
<i>Mugil cephalus</i>	2,626	7.7	83.9	11.42	1.42	188.94	216.00	250	1.00	100	408
<i>Bairdiella chrysoura</i>	2,137	6.3	29.1	9.29	2.60	424.82	353.00	113	0.33	43	191
<i>Dasyatis sabina</i>	1,499	4.4	78.3	6.52	0.80	186.39	98.00	224	1.55	93	399
<i>Sphoeroides nephelus</i>	1,417	4.2	73.9	6.16	0.86	212.53	156.00	165	0.75	50	285
<i>Eucinostomus harengulus</i>	1,407	4.1	39.1	6.12	1.96	486.10	408.00	100	0.35	43	175
<i>Elops saurus</i>	959	2.8	37.0	4.17	1.78	645.87	381.00	300	1.91	112	554
Subtotal	27,368	80.4	.	.	.	.	.	.	.	43	554
Totals	34,043	100.0	.	148.01	12.17	124.67	1,546.00	.	.	11	1095

Table IR07-05. Catch statistics for Selected Taxa collected in 230 183-m haul seine samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Mugil curema</i>	2,820	8.3	82.2	12.26	1.86	230.04	255.00	157	0.75	81	352
<i>Mugil cephalus</i>	2,626	7.7	83.9	11.42	1.42	188.94	216.00	250	1.00	100	408
<i>Elops saurus</i>	959	2.8	37.0	4.17	1.78	645.87	381.00	300	1.91	112	554
<i>Archosargus probatocephalus</i>	846	2.5	52.6	3.68	0.49	200.02	56.00	196	3.13	25	473
<i>Sciaenops ocellatus</i>	344	1.0	49.1	1.50	0.16	160.37	15.00	413	7.51	102	1095
<i>Centropomus undecimalis</i>	322	0.9	35.7	1.40	0.23	249.10	29.00	416	6.92	153	904
<i>Leiostomus xanthurus</i>	209	0.6	8.7	0.91	0.33	555.50	55.00	177	1.83	83	290
<i>Lutjanus griseus</i>	171	0.5	20.0	0.74	0.17	353.73	28.00	180	4.22	76	560
<i>Trachinotus falcatus</i>	162	0.5	7.0	0.70	0.46	993.42	104.00	267	8.31	36	374
<i>Callinectes sapidus</i>	157	0.5	21.3	0.68	0.14	310.06	19.00	124	3.32	36	201
<i>Cynoscion nebulosus</i>	152	0.4	25.2	0.66	0.12	275.94	13.00	194	6.55	48	512
<i>Menticirrhus americanus</i>	131	0.4	13.5	0.57	0.20	526.89	39.00	191	3.41	67	302
<i>Pogonias cromis</i>	129	0.4	21.3	0.56	0.14	375.67	27.00	421	19.93	137	927
<i>Micropogonias undulatus</i>	53	0.2	3.9	0.23	0.11	753.71	17.00	166	3.98	132	285
<i>Cynoscion complex</i>	44	0.1	2.2	0.19	0.12	981.64	27.00	186	5.77	129	292
<i>Lutjanus analis</i>	43	0.1	5.2	0.19	0.07	534.84	9.00	124	5.72	50	265
<i>Paralichthys albigutta</i>	37	0.1	6.1	0.16	0.06	593.92	10.00	185	10.83	95	381

Table IR07-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus duorarum</i>	27	0.1	6.1	0.12	0.05	621.33	10.00	22	1.16	15	40
<i>Albula vulpes</i>	21	0.1	2.2	0.09	0.05	809.45	8.00	180	5.61	138	217
<i>Scomberomorus maculatus</i>	20	0.1	4.3	0.09	0.03	609.19	6.00	261	21.79	144	493
<i>Lutjanus synagris</i>	19	0.1	1.3	0.08	0.07	1,360.91	17.00	94	2.89	68	110
<i>Mycteroperca microlepis</i>	15	0.0	1.7	0.07	0.04	1,003.18	9.00	156	16.39	98	279
<i>Trachinotus carolinus</i>	10	0.0	3.5	0.04	0.02	559.79	2.00	361	13.92	254	406
<i>Pomatomus saltatrix</i>	8	0.0	2.2	0.03	0.02	753.30	3.00	328	41.72	106	416
<i>Litopenaeus setiferus</i>	3	0.0	0.4	0.01	0.01	1,516.58	3.00	30	2.08	27	34
<i>Paralichthys lethostigma</i>	2	0.0	0.9	0.01	0.01	1,070.04	1.00	338	32.00	306	370
<i>Farfantepenaeus aztecus</i>	2	0.0	0.4	0.01	0.01	1,516.58	2.00	28	0.00	28	28
<i>Mycteroperca bonaci</i>	2	0.0	0.4	0.01	0.01	1,516.58	2.00	266	20.00	246	286
<i>Farfantepenaeus</i> spp.	1	0.0	0.4	0.00	0.00	1,516.58	1.00	11	.	11	11
<i>Menippe</i> sp.	1	0.0	0.4	0.00	0.00	1,516.58	1.00	79	.	79	79
<i>Megalops atlanticus</i>	1	0.0	0.4	0.00	0.00	1,516.58	1.00	1035	.	1035	1035
<i>Lutjanus jocu</i>	1	0.0	0.4	0.00	0.00	1,516.58	1.00	90	.	90	90
<i>Scomberomorus regalis</i>	1	0.0	0.4	0.00	0.00	1,516.58	1.00	204	.	204	204
Totals	9,339	27.4	100.0	40.60	3.24	121.08	413.00	.	.	11	1095

Table IR07-06. Catch statistics for 10 dominant taxa collected in 96 6.1-m bay otter trawl samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Eucinostomus</i> spp.	1,505	24.9	40.6	2.99	0.92	301.38	58.78	23	0.20	10	39
<i>Callinectes sapidus</i>	742	12.3	38.5	1.45	0.64	434.09	48.18	35	1.22	5	169
<i>Gobiosoma</i> spp.	565	9.3	47.9	1.26	0.43	336.81	34.54	16	0.10	7	19
<i>Anchoa mitchilli</i>	637	10.5	20.8	1.18	0.69	573.25	63.41	35	0.38	13	50
<i>Gobiosoma robustum</i>	359	5.9	45.8	0.87	0.23	253.42	13.76	23	0.16	20	34
<i>Syngnathus scovelli</i>	273	4.5	44.8	0.74	0.21	284.92	15.52	68	0.71	38	96
<i>Diapterus auratus</i>	253	4.2	15.6	0.51	0.34	646.60	31.99	24	0.79	12	102
<i>Eucinostomus gula</i>	235	3.9	36.5	0.49	0.13	251.53	10.02	67	1.08	41	104
<i>Lagodon rhomboides</i>	138	2.3	35.4	0.29	0.08	260.23	5.01	101	1.71	19	151
<i>Callinectes similis</i>	140	2.3	28.1	0.28	0.09	297.22	4.82	39	1.83	8	107
Subtotal	4,847	80.1	.	.	.	.	.	.	.	5	169
Totals	6,050	100.0	.	12.63	1.91	147.89	96.37	.	.	4	383

Table IR07-07. Catch statistics for Selected Taxa collected in 96 6.1-m bay otter trawl samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Callinectes sapidus</i>	742	12.3	38.5	1.45	0.64	434.09	48.18	35	1.22	5	169
<i>Farfantepenaeus</i> spp.	126	2.1	37.5	0.27	0.05	171.95	1.86	9	0.23	4	14
<i>Lutjanus griseus</i>	51	0.8	11.5	0.10	0.06	600.11	5.97	46	5.26	12	189
<i>Farfantepenaeus duorarum</i>	31	0.5	18.8	0.08	0.03	320.74	2.02	18	0.42	15	23
<i>Archosargus probatocephalus</i>	35	0.6	13.5	0.07	0.03	369.19	2.31	98	12.67	12	282
<i>Lutjanus synagris</i>	35	0.6	7.3	0.07	0.03	469.16	2.31	49	5.27	15	120
<i>Cynoscion</i> complex	28	0.5	6.3	0.06	0.03	524.93	2.25	40	9.11	14	226
<i>Sciaenops ocellatus</i>	27	0.4	3.1	0.05	0.04	811.06	4.24	16	0.90	11	31
<i>Cynoscion nebulosus</i>	24	0.4	8.3	0.04	0.02	414.37	1.35	38	6.20	15	173
<i>Menticirrhus americanus</i>	18	0.3	7.3	0.03	0.02	450.78	1.16	93	27.08	14	335
<i>Micropogonias undulatus</i>	10	0.2	6.3	0.03	0.01	486.95	0.96	19	2.70	12	42
<i>Lutjanus analis</i>	12	0.2	6.3	0.02	0.01	462.94	0.77	71	13.52	17	162
<i>Paralichthys albigutta</i>	4	0.1	4.2	0.01	0.00	492.83	0.27	212	45.35	79	284
<i>Elops saurus</i>	3	0.0	3.1	0.01	0.00	560.79	0.19	38	0.67	37	39
<i>Albula vulpes</i>	2	0.0	1.0	0.00	0.00	979.80	0.34	30	2.50	27	32
<i>Leiostomus xanthurus</i>	2	0.0	1.0	0.00	0.00	979.80	0.34	168	14.50	153	182
<i>Farfantepenaeus aztecus</i>	1	0.0	1.0	0.00	0.00	979.80	0.22	19	.	19	19
<i>Menippe</i> sp.	1	0.0	1.0	0.00	0.00	979.80	0.19	26	.	26	26
<i>Mycteroperca microlepis</i>	1	0.0	1.0	0.00	0.00	979.80	0.19	174	.	174	174
Totals	1,153	19.1	67.7	2.31	0.68	286.91	48.18	.	.	4	335

Table IR07-08. Catch statistics for 10 dominant taxa collected in 217 21.3-m river seine samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	123,960	77.3	58.5	840.07	178.28	312.61	21,472.06	29	0.02	12	55
<i>Eucinostomus</i> spp.	11,101	6.9	84.3	75.23	8.80	172.38	720.59	26	0.07	8	39
<i>Diapterus auratus</i>	9,501	5.9	85.7	64.39	7.83	179.10	755.88	38	0.20	10	181
<i>Brevoortia</i> spp.	2,553	1.6	16.1	17.30	7.47	636.27	1,088.24	27	0.16	19	79
<i>Eucinostomus harengulus</i>	2,173	1.4	69.6	14.73	1.93	193.24	214.71	54	0.24	40	114
<i>Eugerres plumieri</i>	1,542	1.0	46.5	10.45	2.75	387.63	516.18	36	0.82	12	240
<i>Centropomus undecimalis</i>	1,280	0.8	52.5	8.67	1.69	287.65	252.94	51	1.85	13	596
<i>Gambusia holbrooki</i>	1,183	0.7	28.1	8.02	2.72	499.21	394.12	23	0.17	10	39
<i>Menidia</i> spp.	978	0.6	41.5	6.63	1.48	329.89	170.59	30	0.30	10	72
<i>Mugil curema</i>	794	0.5	26.7	5.38	2.40	657.40	463.24	39	1.08	16	221
Subtotal	155,065	96.7	.	.	.	.	.	.	.	8	596
Totals	160,265	100.0	.	1,086.10	184.20	249.84	22,220.59	.	.	3	596

Table IR07-09. Catch statistics for Selected Taxa collected in 217 21.3-m river seine samples during northern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Centropomus undecimalis</i>	1,280	0.8	52.5	8.67	1.69	287.65	252.94	51	1.85	13	596
<i>Mugil curema</i>	794	0.5	26.7	5.38	2.40	657.40	463.24	39	1.08	16	221
<i>Farfantepenaeus</i> spp.	702	0.4	39.6	4.76	1.82	562.39	370.59	8	0.11	3	14
<i>Callinectes sapidus</i>	615	0.4	43.8	4.17	0.86	302.92	126.47	15	0.71	4	194
<i>Micropogonias undulatus</i>	304	0.2	8.8	2.06	0.91	651.80	136.76	33	0.47	16	67
<i>Litopenaeus setiferus</i>	165	0.1	12.9	1.12	0.59	778.96	122.06	8	0.23	4	21
<i>Archosargus probatocephalus</i>	127	0.1	32.3	0.86	0.13	228.61	14.71	93	7.40	13	373
<i>Sciaenops ocellatus</i>	103	0.1	8.3	0.70	0.29	606.51	42.65	35	3.12	12	339
<i>Mugil cephalus</i>	93	0.1	18.4	0.63	0.14	317.98	17.65	149	12.17	19	380
<i>Leiostomus xanthurus</i>	66	0.0	5.5	0.45	0.21	704.58	41.18	26	1.26	16	71
<i>Lutjanus griseus</i>	61	0.0	17.1	0.41	0.09	315.46	11.76	113	8.36	18	227
<i>Farfantepenaeus duorarum</i>	23	0.0	5.5	0.16	0.07	637.32	13.24	17	0.44	15	22
<i>Trachinotus falcatus</i>	16	0.0	2.3	0.11	0.08	1,039.22	16.18	30	3.55	8	61
<i>Elops saurus</i>	7	0.0	3.2	0.05	0.02	548.99	1.47	65	28.01	28	232
<i>Lutjanus jocu</i>	5	0.0	1.8	0.03	0.02	774.83	2.94	115	16.82	60	163
<i>Cynoscion nebulosus</i>	5	0.0	1.8	0.03	0.02	774.83	2.94	38	7.59	16	60
<i>Farfantepenaeus aztecus</i>	2	0.0	0.9	0.01	0.01	1,039.22	1.47	17	0.00	17	17

Table IR07-09. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Albula vulpes</i>	2	0.0	0.5	0.01	0.01	1,473.09	2.94	38	1.00	37	39
<i>Trachinotus carolinus</i>	2	0.0	0.5	0.01	0.01	1,473.09	2.94	13	1.00	12	14
<i>Cynoscion complex</i>	2	0.0	0.5	0.01	0.01	1,473.09	2.94	36	3.00	33	39
<i>Paralichthys lethostigma</i>	2	0.0	0.5	0.01	0.01	1,473.09	2.94	299	17.50	281	316
<i>Pomatomus saltatrix</i>	1	0.0	0.5	0.01	0.01	1,473.09	1.47	83	.	83	83
<i>Mugil gyrans</i>	1	0.0	0.5	0.01	0.01	1,473.09	1.47	33	.	33	33
Totals	4,378	2.7	86.6	29.67	4.37	216.79	541.18	.	.	3	596

Appendix IR07-01. Monthly summary of species collected during northern Indian River Lagoon stratified-random sampling, 2007. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Acanthostracion quadricornis</i>	.	.	1	.	.	.	.	.	1	.	.	2	4
<i>Achiridae</i> sp.	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Achirus lineatus</i>	22	6	4	5	1	4	9	18	6	16	12	16	119
<i>Agonostomus monticola</i>	7	.	.	.	.	.	.	.	.	4	4	.	15
<i>Albula vulpes</i>	5	1	.	.	11	19	2	2	.	.	1	.	41
<i>Aluterus schoepfii</i>	.	.	.	.	.	2	.	.	.	.	.	1	3
<i>Amia calva</i>	.	1	.	.	.	.	.	.	.	1	.	.	2
<i>Anchoa hepsetus</i>	4	5	5	42	196	9	.	3	38	.	7	.	309
<i>Anchoa mitchilli</i>	34,816	16,930	27,468	8,174	8,300	17,117	79,442	24,499	21,522	24,493	9,025	28,975	300,761
<i>Anchoa</i> spp.	.	4	.	.	.	.	.	.	.	.	.	.	4
<i>Anisotremus virginicus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Apalone ferox</i>	.	.	.	.	1	.	.	.	.	.	.	.	1
<i>Archosargus probatocephalus</i>	36	30	63	88	254	240	152	241	81	104	65	85	1,439
<i>Archosargus rhomboidalis</i>	.	.	.	.	.	.	4	2	1	21	.	.	28
<i>Archosargus</i> spp.	2	.	.	.	.	.	.	.	.	.	.	.	2
<i>Ariopsis felis</i>	170	239	344	161	368	682	180	135	279	244	132	369	3,303
<i>Astroscopus y-graecum</i>	.	.	.	.	.	.	.	.	.	.	.	1	1
<i>Bagre marinus</i>	22	.	7	.	.	5	6	.	.	.	2	4	46
<i>Bairdiella chrysoura</i>	343	61	191	80	235	441	1,421	575	216	782	207	58	4,610
<i>Bairdiella sanctaeluciae</i>	.	.	.	.	.	.	12	.	.	.	1	.	13
<i>Bathygobius soporator</i>	2	.	.	1	.	.	1	1	.	.	1	1	7
<i>Brevoortia</i> spp.	48	101	1,255	1,066	271	82	187	4	1	3	1	3	3,022
<i>Calamus arctifrons</i>	.	3	3	.	1	.	.	.	.	.	.	.	7
<i>Callinectes sapidus</i>	125	63	25	34	24	25	412	247	310	340	97	74	1,776

Appendix IR07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Callinectes similis</i>	20	16	24	13	14	38	44	4	39	4	11	1	228
<i>Callinectes</i> spp.	.	.	1	.	.	.	1	.	.	.	.	.	2
<i>Canthidermis maculata</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Caranx hippos</i>	25	8	27	2	14	10	14	29	7	8	5	17	166
<i>Caranx latus</i>	.	.	2	.	.	.	.	.	1	.	1	.	4
<i>Centropomus parallelus</i>	3	2	.	.	.	.	6	.	.	.	.	13	24
<i>Centropomus pectinatus</i>	1	.	.	.	.	.	.	1	.	4	4	1	11
<i>Centropomus</i> sp.	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Centropomus undecimalis</i>	185	62	48	51	39	27	127	122	38	564	171	208	1,642
<i>Chaetodipterus faber</i>	1	.	1	1	2	2	15	56	18	9	5	.	110
<i>Chasmodes saburrae</i>	2	7	7	5	7	7	18	3	15	3	29	3	106
<i>Chilomycterus schoepfii</i>	10	16	22	9	16	14	23	18	23	34	21	31	237
<i>Chloroscombrus chrysurus</i>	2	1	8	.	.	.	1	2	1	3	.	11	29
<i>Cichlidae</i> sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Citharichthys spilopterus</i>	28	8	22	9	3	16	20	20	2	4	3	3	138
<i>Clupeidae</i> spp.	1	4	.	2	.	.	.	.	.	.	.	.	7
<i>Coryphaena hippurus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Ctenogobius boleosoma</i>	53	22	69	3	.	7	3	15	.	9	6	4	191
<i>Ctenogobius pseudofasciatus</i>	.	2	1	.	.	.	1	.	.	.	.	1	5
<i>Ctenogobius shufeldti</i>	.	3	.	.	.	.	1	.	.	2	3	15	24
<i>Ctenogobius smaragdus</i>	.	.	.	.	.	.	6	.	.	.	.	.	6
<i>Ctenogobius</i> spp.	.	.	1	.	.	.	1	.	.	.	.	.	2
<i>Ctenogobius stigmaticus</i>	.	.	.	.	.	.	2	.	.	.	.	.	2
<i>Cynoscion nebulosus</i>	17	14	4	4	12	16	51	76	52	264	87	44	641
<i>Cynoscion</i> complex	8	.	34	.	.	2	3	2	18	8	4	.	79
<i>Cyprinodon variegatus</i>	23	53	3	8	55	179	1	6	3	71	136	.	538

Appendix IR07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Dasyatis sabina</i>	57	63	112	229	87	187	114	152	199	207	87	95	1,589
<i>Dasyatis say</i>	8	4	8	13	16	9	17	8	7	15	8	16	129
<i>Diapterus auratus</i>	1,917	921	1,112	367	270	774	2,164	2,888	1,611	1,779	1,342	2,677	17,822
<i>Diplodus holbrookii</i>	.	2	.	.	2	.	.	.	.	.	.	.	4
<i>Dormitator maculatus</i>	.	.	.	.	.	.	2	.	.	.	.	2	4
<i>Dorosoma cepedianum</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Echeneis naucrates</i>	1	.	.	.	.	.	.	.	.	.	.	.	1
<i>Elops saurus</i>	99	4	123	19	33	88	13	40	45	44	47	420	975
<i>Epinephelus itajara</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Eucinostomus argenteus</i>	.	.	.	.	.	.	.	.	28	.	.	.	28
<i>Eucinostomus gula</i>	233	80	244	96	54	194	98	124	315	135	264	140	1,977
<i>Eucinostomus harengulus</i>	254	315	408	375	440	503	404	750	254	245	106	692	4,746
<i>Eucinostomus jonesii</i>	2	1	.	4	6	.	.	.	4	.	17	5	39
<i>Eucinostomus spp.</i>	1,673	2,551	1,552	304	453	698	1,211	1,728	1,117	2,623	2,088	2,412	18,410
<i>Eugerres plumieri</i>	14	8	21	12	78	530	507	148	56	79	63	40	1,556
<i>Evorthodus lyricus</i>	12	4	1	.	.	2	3	5	.	20	3	11	61
<i>Farfantepenaeus aztecus</i>	.	.	4	.	1	.	2	.	1	.	.	1	9
<i>Farfantepenaeus brasiliensis</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Farfantepenaeus duorarum</i>	30	7	39	40	13	13	17	6	12	30	22	8	237
<i>Farfantepenaeus spp.</i>	666	164	155	88	65	32	47	57	68	174	154	39	1,709
<i>Floridichthys carpio</i>	129	398	304	175	112	484	220	266	372	566	267	165	3,458
<i>Fundulus grandis</i>	2	2	5	.	2	5	.	1	.	.	4	.	21
<i>Fundulus seminolis</i>	.	.	.	.	.	.	2	.	.	1	17	.	20
<i>Gambusia holbrooki</i>	296	16	63	56	116	22	63	39	11	33	306	486	1,507
<i>Gerres cinereus</i>	1	2	.	.	.	1	5	2	41	3	4	30	89
<i>Gobiesox strumosus</i>	.	.	.	.	.	1	.	.	.	.	.	2	3

Appendix IR07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Gobiomorus dormitor</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Gobionellus oceanicus</i>	6	4	.	3	1	.	.	25	.	10	5	1	55
<i>Gobiosoma bosc</i>	4	42	1	4	19	3	3	11	3	4	.	8	102
<i>Gobiosoma ginsburgi</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Gobiosoma robustum</i>	100	215	364	115	127	78	234	220	75	82	403	139	2,152
<i>Gobiosoma</i> spp.	175	138	156	20	83	76	201	506	75	348	496	112	2,386
<i>Gymnura micrura</i>	.	1	.	.	.	1	1	3	3	.	.	1	10
<i>Haemulon aurolineatum</i>	.	.	.	.	.	.	.	2	.	.	.	.	2
<i>Haemulon parra</i>	2	10	.	.	1	1	17	5	5	.	17	1	59
<i>Haemulon plumierii</i>	4	.	.	.	.	.	.	.	.	.	6	.	10
<i>Haemulon sciurus</i>	.	.	.	.	.	.	.	.	.	.	2	.	2
<i>Harengula jaguana</i>	5	.	24	4	4	416	360	300	16	114	97	.	1,340
<i>Hemichromis letourneuxi</i>	.	.	.	.	.	.	.	.	.	.	.	3	3
<i>Heterandria formosa</i>	.	2	1	1	.	.	.	.	.	1	.	.	5
<i>Hippocampus erectus</i>	.	.	.	2	1	.	3	.	1	1	2	3	13
<i>Hippocampus zosterae</i>	.	.	1	1	.	2	1	.	.	2	4	6	17
<i>Hirundichthys</i> sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Histrio histrio</i>	.	.	2	.	.	.	.	.	.	.	.	.	2
<i>Hyporhamphus meeki</i>	1	1	1	1	15	4	8	5	13	20	1	2	72
<i>Hyporhamphus</i> spp.	.	.	2	.	.	.	.	.	.	2	2	.	6
<i>Hyporhamphus unifasciatus</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Jordanella floridae</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Labidesthes sicculus</i>	52	57	11	12	7	.	6	5	10	27	33	16	236
<i>Lactophrys trigonus</i>	.	1	.	.	.	.	1	1	.	.	1	.	4
<i>Lagodon rhomboides</i>	863	253	598	262	605	548	838	1,705	498	611	196	94	7,071
<i>Leiostomus xanthurus</i>	24	35	38	19	14	93	10	.	28	26	1	7	295

Appendix IR07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Lepisosteus platyrhincus</i>	2	.	.	.	.	.	3	.	.	1	1	.	7
<i>Lepomis auritus</i>	1	2	1	2	.	1	.	.	.	.	.	2	9
<i>Lepomis gulosus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Lepomis macrochirus</i>	.	.	4	2	.	1	1	5	2	8	.	23	46
<i>Lepomis microlophus</i>	3	1	1	.	.	.	1	1	.	3	.	1	11
<i>Lepomis punctatus</i>	1	.	1	.	.	.	.	.	.	.	.	2	4
<i>Lepomis spp.</i>	.	.	.	.	.	1	7	17	35	18	.	2	80
<i>Limulus polyphemus</i>	.	.	9	4	.	.	1	.	.	1	1	.	16
<i>Litopenaeus setiferus</i>	10	.	.	12	.	10	4	189	3	133	82	18	461
<i>Lobotes surinamensis</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Lophogobius cyprinoides</i>	.	.	3	1	15	43	110	6	5	13	11	23	230
<i>Lucania goodei</i>	4	1	.	4	.	.	1	1	1	1	.	3	16
<i>Lucania parva</i>	991	3,588	1,241	1,676	1,272	3,233	1,665	1,219	1,385	3,387	1,915	645	22,217
<i>Lupinoblennius nicholsi</i>	.	.	.	1	1	1	.	2	3	.	.	2	10
<i>Lutjanus analis</i>	1	4	5	.	6	1	12	16	10	16	.	8	79
<i>Lutjanus griseus</i>	18	1	3	4	11	31	43	61	32	50	48	13	315
<i>Lutjanus jocu</i>	.	1	.	.	.	.	3	.	.	.	1	2	7
<i>Lutjanus synagris</i>	17	4	.	.	.	1	7	22	15	2	11	1	80
<i>Malaclemys terrapin</i>	.	.	.	.	1	.	.	.	2	.	.	.	3
<i>Megalops atlanticus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Membras martinica</i>	1	.	5	.	3	.	10	76	2	34	5	20	156
<i>Menidia spp.</i>	156	2,969	517	527	1,328	3,702	1,571	978	1,240	364	863	140	14,355
<i>Menippe spp.</i>	1	.	.	.	1	.	.	.	.	.	.	.	2
<i>Menticirrhus americanus</i>	44	3	14	2	20	12	16	82	9	43	76	19	340
<i>Microgobius gulosus</i>	173	68	181	41	220	618	430	497	224	2,033	731	482	5,698
<i>Microgobius microlepis</i>	.	.	.	.	.	.	.	.	.	.	1	.	1

Appendix IR07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Microgobius thalassinus</i>	1	.	.	.	.	1	16	22	3	19	.	.	62
<i>Microphis brachyurus</i>	2	1	.	2	.	1	.	.	1	2	.	1	10
<i>Micropogonias undulatus</i>	451	18	120	5	.	.	.	19	3	1	39	226	882
<i>Micropterus salmoides</i>	1	.	1	.	.	.	2	.	1	1	.	1	7
<i>Mugil cephalus</i>	321	1,045	350	228	298	123	125	120	185	123	224	147	3,289
<i>Mugil curema</i>	359	646	456	350	784	179	89	66	109	126	415	327	3,906
<i>Mugil gyrans</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Mycteroperca bonaci</i>	.	.	.	.	.	.	2	.	.	.	.	.	2
<i>Mycteroperca microlepis</i>	1	.	.	.	4	.	9	.	.	1	1	.	16
<i>Myrophis punctatus</i>	.	.	2	2	.	.	3	.	.	.	.	.	7
<i>Nicholsina usta</i>	.	.	3	.	.	.	1	.	.	.	.	1	5
<i>Notropis maculatus</i>	.	.	.	.	.	.	.	.	.	4	.	.	4
<i>Notropis spp.</i>	1	.	.	.	.	.	.	.	1	.	.	.	2
<i>Noturus sp.</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Ocyurus chrysurus</i>	.	.	.	.	.	.	2	3	.	.	1	.	6
<i>Oligoplites saurus</i>	3	11	20	11	11	51	107	33	52	86	32	5	422
<i>Opisthonema oglinum</i>	3	2	7	18	53	52	75	169	64	291	1	.	735
<i>Opsanus tau</i>	.	.	.	5	.	3	2	2	2	3	2	.	19
<i>Oreochromis aureus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Oreochromis spp.</i>	.	.	.	.	.	.	.	12	.	.	.	.	12
<i>Orthopristis chrysoptera</i>	56	4	101	64	164	33	148	159	31	34	38	47	879
<i>Ostraciidae spp.</i>	.	.	3	.	.	1	.	.	.	.	2	.	6
<i>Paralichthys albigutta</i>	2	1	.	1	6	3	6	12	1	10	1	.	43
<i>Paralichthys lethostigma</i>	.	.	.	.	.	.	.	3	.	1	.	.	4
<i>Poecilia latipinna</i>	48	16	3	4	63	296	57	.	12	6	423	77	1,005
<i>Pogonias cromis</i>	33	1	9	6	2	13	17	11	5	9	10	15	131

Appendix IR07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Pomadasys crocro</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Pomatomus saltatrix</i>	.	.	.	.	3	1	1	1	.	3	.	.	9
<i>Portunus</i> spp.	.	.	.	.	.	1	15	.	.	.	.	.	16
<i>Prionotus scitulus</i>	.	4	1	.	3	2	1	10	3	1	1	.	26
<i>Prionotus tribulus</i>	6	3	2	1	.	4	.	1	1	.	6	.	24
<i>Pseudemys nelsoni</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Pseudemys peninsularis</i>	.	.	.	1	.	.	2	.	.	.	.	.	3
<i>Pterygoplichthys</i> spp.	.	.	.	.	.	.	.	.	.	1	1	.	2
<i>Rimapenaeus constrictus</i>	.	.	.	.	.	.	2	.	.	.	.	.	2
<i>Sarotherodon melanotheron</i>	23	1	.	2	.	2	.	2	1	3	1	.	35
<i>Sciaenops ocellatus</i>	224	87	53	31	24	24	23	46	39	174	277	82	1,084
<i>Scomberomorus maculatus</i>	1	.	9	.	.	2	7	.	.	.	1	1	21
<i>Scomberomorus regalis</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Scorpaena grandicornis</i>	.	.	.	.	.	.	.	1	.	.	.	1	2
<i>Selene vomer</i>	22	1	21	11	9	62	16	8	9	30	1	2	192
<i>Sphoeroides nephelus</i>	108	110	174	93	114	94	81	105	126	131	180	278	1,594
<i>Sphoeroides spengleri</i>	1	2	1	.	1	3	.	2	1	3	1	1	16
<i>Sphoeroides testudineus</i>	41	10	29	12	14	31	17	73	16	23	12	26	304
<i>Sphyraena barracuda</i>	.	.	2	1	1	14	5	2	8	15	5	15	68
<i>Sphyraena guachancho</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Sphyma tiburo</i>	.	.	.	.	.	.	.	2	.	1	.	1	4
<i>Stephanolepis hispidus</i>	4	1	5	2	1	4	1	.	1	.	2	5	26
<i>Strongylura marina</i>	.	.	1	1	3	6	.	2	4	4	.	15	36
<i>Strongylura notata</i>	14	10	10	11	43	176	134	99	136	96	40	31	800
<i>Strongylura</i> spp.	1	.	2	10	7	8	.	.	.	3	2	1	34
<i>Strongylura timucu</i>	1	.	.	.	1	.	1	3	.	.	4	4	14

Appendix IR07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=73	E=73	E=74	E=74	E=73	E=73	E=73	E=73	E=74	E=95	E=95	E=73	E=923
<i>Symphurus plagiusa</i>	.	.	5	.	.	1	.	2	2	.	.	.	10
<i>Syngnathus louisianae</i>	9	3	2	2	4	11	14	3	2	4	10	4	68
<i>Syngnathus scovelli</i>	55	45	150	84	109	85	71	65	39	73	112	33	921
<i>Synodus foetens</i>	1	1	.	4	5	2	1	.	.	1	.	1	16
<i>Tilapia mariae</i>	.	.	.	.	.	.	2	1	.	8	10	22	43
<i>Trachinotus carolinus</i>	.	1	.	3	7	2	.	.	2	.	4	.	19
<i>Trachinotus falcatus</i>	8	1	14	29	23	1	6	8	7	106	22	8	233
<i>Trinectes maculatus</i>	16	1	5	2	2	5	4	6	.	22	4	38	105
<i>Tylosurus acus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
Totals	45,851	31,634	38,542	15,254	17,086	32,662	93,690	39,332	31,377	41,726	21,739	40,397	449,290

Appendix IR07-02. Summary by gear and stratum of species collected during northern Indian River Lagoon stratified-random sampling, 2007. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was post-stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata								Totals E=923
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=111	E=53	E=216	E=158	E=59	E=163	E=67	E=96	
<i>Acanthostracion quadricornis</i>	.	.	.	.	.	1	2	1	4
<i>Achiridae</i> sp.	.	.	.	1	.	.	.	.	1
<i>Achirus lineatus</i>	4	2	32	21	11	26	5	18	119
<i>Agonostomus monticola</i>	.	.	.	11	4	.	.	.	15
<i>Albula vulpes</i>	3	.	13	2	.	15	6	2	41
<i>Aluterus schoepfii</i>	.	.	.	.	.	.	1	2	3
<i>Amia calva</i>	.	.	.	2	.	.	.	.	2
<i>Anchoa hepsetus</i>	79	149	60	13	7	.	.	1	309
<i>Anchoa mitchilli</i>	13,342	20,228	142,594	96,539	27,421	.	.	637	300,761
<i>Anchoa</i> spp.	.	.	.	.	4	.	.	.	4
<i>Anisotremus virginicus</i>	.	.	.	.	.	1	.	.	1
<i>Apalone ferox</i>	.	.	.	1	.	.	.	.	1
<i>Archosargus probatocephalus</i>	84	19	328	86	41	639	207	35	1,439
<i>Archosargus rhomboidalis</i>	.	1	2	.	.	24	.	1	28
<i>Archosargus</i> spp.	.	.	.	.	.	2	.	.	2
<i>Ariopsis felis</i>	33	15	33	17	.	2,232	926	47	3,303
<i>Astroscopus y-graecum</i>	.	.	.	.	.	.	1	.	1
<i>Bagre marinus</i>	.	.	.	.	.	20	26	.	46
<i>Bairdiella chrysoura</i>	1,349	164	857	1	22	1,468	669	80	4,610
<i>Bairdiella sanctaeluciae</i>	.	.	.	.	.	.	.	13	13
<i>Bathygobius soporator</i>	.	.	1	1	5	.	.	.	7
<i>Brevoortia</i> spp.	77	2	153	2,233	320	172	65	.	3,022
<i>Calamus arctifrons</i>	1	.	4	.	.	.	1	1	7

Appendix IR07-02. (Continued)

Species	Gear and Strata								Totals E=923
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=111	E=53	E=216	E=158	E=59	E=163	E=67	E=96	
<i>Callinectes sapidus</i>	72	7	183	418	197	120	37	742	1,776
<i>Callinectes similis</i>	2	1	53	.	9	19	4	140	228
<i>Callinectes</i> spp.	.	.	1	.	1	.	.	.	2
<i>Canthidermis maculata</i>	.	.	1	.	.	.	.	.	1
<i>Caranx hippos</i>	3	.	1	7	4	130	21	.	166
<i>Caranx latus</i>	.	.	.	.	.	2	2	.	4
<i>Centropomus parallelus</i>	.	.	.	16	8	.	.	.	24
<i>Centropomus pectinatus</i>	.	.	.	10	1	.	.	.	11
<i>Centropomus</i> sp.	.	.	.	1	.	.	.	.	1
<i>Centropomus undecimalis</i>	3	.	37	1,100	180	228	94	.	1,642
<i>Chaetodipterus faber</i>	5	1	5	.	.	77	21	1	110
<i>Chasmodes saburrae</i>	26	1	58	.	.	3	5	13	106
<i>Chilomycterus schoepfii</i>	8	.	.	.	.	84	54	91	237
<i>Chloroscombrus chrysurus</i>	2	1	.	.	.	15	8	3	29
<i>Cichlidae</i> sp.	.	.	1	.	.	.	.	.	1
<i>Citharichthys spilopterus</i>	3	1	35	20	36	35	2	6	138
<i>Clupeidae</i> spp.	3	.	.	.	4	.	.	.	7
<i>Coryphaena hippurus</i>	.	.	.	.	1	.	.	.	1
<i>Ctenogobius boleosoma</i>	25	.	117	9	35	.	.	5	191
<i>Ctenogobius pseudofasciatus</i>	.	.	.	5	.	.	.	.	5
<i>Ctenogobius shufeldti</i>	.	.	1	9	14	.	.	.	24
<i>Ctenogobius smaragdus</i>	.	.	6	.	.	.	.	.	6
<i>Ctenogobius</i> spp.	.	.	1	1	.	.	.	.	2
<i>Ctenogobius stigmaticus</i>	.	.	2	.	.	.	.	.	2
<i>Cynoscion nebulosus</i>	213	9	238	4	1	117	35	24	641
<i>Cynoscion</i> complex	1	3	1	2	.	12	32	28	79
<i>Cyprinodon variegatus</i>	5	15	518	.	.	.	.	.	538
<i>Dasyatis sabina</i>	31	9	25	8	1	1,109	390	16	1,589
<i>Dasyatis say</i>	.	1	2	.	.	92	34	.	129
<i>Diapterus auratus</i>	629	183	2,320	7,165	2,336	3,949	987	253	17,822
<i>Diplodus holbrookii</i>	2	.	2	.	.	.	.	.	4
<i>Dormitator maculatus</i>	.	.	.	2	2	.	.	.	4
<i>Dorosoma cepedianum</i>	.	.	.	.	1	.	.	.	1

Appendix IR07-02. (Continued)

Species	Gear and Strata								Totals E=923
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=111	E=53	E=216	E=158	E=59	E=163	E=67	E=96	
<i>Echeneis naucrates</i>	.	.	.	.	.	1	.	.	1
<i>Elops saurus</i>	.	2	4	4	3	886	73	3	975
<i>Epinephelus itajara</i>	.	.	1	.	.	.	.	.	1
<i>Eucinostomus argenteus</i>	1	.	27	.	.	.	.	.	28
<i>Eucinostomus gula</i>	143	4	748	29	89	584	145	235	1,977
<i>Eucinostomus harengulus</i>	300	18	709	1,620	553	1,159	248	139	4,746
<i>Eucinostomus jonesii</i>	3	.	31	1	2	.	2	.	39
<i>Eucinostomus</i> spp.	2,049	149	3,606	8,560	2,541	.	.	1,505	18,410
<i>Eugerres plumieri</i>	.	.	4	1,346	196	5	5	.	1,556
<i>Evorthodus lyricus</i>	.	.	2	38	21	.	.	.	61
<i>Farfantepenaeus aztecus</i>	.	.	4	2	.	.	2	1	9
<i>Farfantepenaeus brasiliensis</i>	.	.	1	.	.	.	.	.	1
<i>Farfantepenaeus duorarum</i>	40	6	110	10	13	9	18	31	237
<i>Farfantepenaeus</i> spp.	193	17	670	293	409	.	1	126	1,709
<i>Floridichthys carpio</i>	562	353	2,540	.	.	3	.	.	3,458
<i>Fundulus grandis</i>	.	.	18	.	2	1	.	.	21
<i>Fundulus seminolis</i>	.	.	.	17	3	.	.	.	20
<i>Gambusia holbrooki</i>	.	.	324	484	699	.	.	.	1,507
<i>Gerres cinereus</i>	.	.	3	6	3	46	31	.	89
<i>Gobiesox strumosus</i>	.	1	2	.	.	.	.	.	3
<i>Gobiomorus dormitor</i>	.	.	.	.	1	.	.	.	1
<i>Gobionellus oceanicus</i>	.	.	4	41	6	3	.	1	55
<i>Gobiosoma bosc</i>	.	.	.	85	17	.	.	.	102
<i>Gobiosoma ginsurji</i>	.	.	.	.	.	.	.	1	1
<i>Gobiosoma robustum</i>	489	47	1,140	113	4	.	.	359	2,152
<i>Gobiosoma</i> spp.	502	28	1,066	185	40	.	.	565	2,386
<i>Gymnura micrura</i>	.	.	.	.	.	5	4	1	10
<i>Haemulon aurolineatum</i>	2	.	.	.	.	.	.	.	2
<i>Haemulon parra</i>	15	.	16	.	.	1	2	25	59
<i>Haemulon plumierii</i>	.	.	.	.	.	.	4	6	10
<i>Haemulon sciurus</i>	.	.	.	.	.	.	.	2	2
<i>Harengula jaguana</i>	422	4	632	9	31	45	193	4	1,340
<i>Hemichromis letourneuxi</i>	.	.	.	1	2	.	.	.	3

Appendix IR07-02. (Continued)

Species	Gear and Strata								Totals E=923
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=111	E=53	E=216	E=158	E=59	E=163	E=67	E=96	
<i>Heterandria formosa</i>	.	.	.	2	3	.	.	.	5
<i>Hippocampus erectus</i>	1	1	1	.	.	2	2	6	13
<i>Hippocampus zosterae</i>	9	2	5	.	.	.	.	1	17
<i>Hirundichthys</i> sp.	.	.	.	.	1	.	.	.	1
<i>Histrio histrio</i>	.	.	.	1	1	.	.	.	2
<i>Hyporhamphus meeki</i>	17	1	14	.	.	31	9	.	72
<i>Hyporhamphus</i> spp.	2	2	2	.	.	.	.	.	6
<i>Hyporhamphus unifasciatus</i>	1	.	.	.	.	.	.	.	1
<i>Jordanella floridae</i>	.	.	.	1	.	.	.	.	1
<i>Labidesthes sicculus</i>	.	.	.	217	19	.	.	.	236
<i>Lactophrys trigonus</i>	.	.	.	.	.	.	1	3	4
<i>Lagodon rhomboides</i>	256	4	233	9	22	4,161	2,248	138	7,071
<i>Leiostomus xanthurus</i>	.	5	13	49	17	119	90	2	295
<i>Lepisosteus platyrhincus</i>	.	.	1	6	.	.	.	.	7
<i>Lepomis auritus</i>	.	.	.	7	2	.	.	.	9
<i>Lepomis gulosus</i>	.	.	.	.	1	.	.	.	1
<i>Lepomis macrochirus</i>	.	.	.	18	28	.	.	.	46
<i>Lepomis microlophus</i>	.	.	.	5	6	.	.	.	11
<i>Lepomis punctatus</i>	.	.	.	2	2	.	.	.	4
<i>Lepomis</i> spp.	.	.	.	17	63	.	.	.	80
<i>Limulus polyphemus</i>	2	.	.	.	.	8	6	.	16
<i>Litopenaeus setiferus</i>	2	.	291	150	15	.	3	.	461
<i>Lobotes surinamensis</i>	.	.	.	.	1	.	.	.	1
<i>Lophogobius cyprinoides</i>	.	.	1	209	20	.	.	.	230
<i>Lucania goodei</i>	.	.	.	12	4	.	.	.	16
<i>Lucania parva</i>	7,407	404	14,231	148	26	.	.	1	22,217
<i>Lupinoblennius nicholsi</i>	.	.	.	8	2	.	.	.	10
<i>Lutjanus analis</i>	20	.	4	.	.	22	21	12	79
<i>Lutjanus griseus</i>	14	1	17	32	29	136	35	51	315
<i>Lutjanus jocu</i>	.	.	1	4	1	.	1	.	7
<i>Lutjanus synagris</i>	23	.	3	.	.	2	17	35	80
<i>Malaclemys terrapin</i>	.	.	.	.	.	3	.	.	3
<i>Megalops atlanticus</i>	.	.	.	.	.	1	.	.	1

Appendix IR07-02. (Continued)

Species	Gear and Strata								Totals E=923
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=111	E=53	E=216	E=158	E=59	E=163	E=67	E=96	
<i>Membras martinica</i>	4	118	34	.	.	.	.	.	156
<i>Menidia</i> spp.	3,809	213	9,355	758	220	.	.	.	14,355
<i>Menippe</i> spp.	.	.	.	.	.	.	1	1	2
<i>Menticirrhus americanus</i>	32	89	70	.	.	44	87	18	340
<i>Microgobius gulosus</i>	2,040	390	2,946	181	125	.	.	16	5,698
<i>Microgobius microlepis</i>	1	.	.	.	.	.	.	.	1
<i>Microgobius thalassinus</i>	4	2	33	20	.	.	.	3	62
<i>Microphis brachyurus</i>	.	.	.	7	3	.	.	.	10
<i>Micropogonias undulatus</i>	34	3	478	44	260	52	1	10	882
<i>Micropterus salmoides</i>	.	.	.	3	4	.	.	.	7
<i>Mugil cephalus</i>	1	4	565	72	21	1,411	1,215	.	3,289
<i>Mugil curema</i>	.	11	281	452	342	1,942	878	.	3,906
<i>Mugil gyrans</i>	.	.	.	1	.	.	.	.	1
<i>Mycteroperca bonaci</i>	.	.	.	.	.	.	2	.	2
<i>Mycteroperca microlepis</i>	.	.	.	.	.	1	14	1	16
<i>Myrophis punctatus</i>	.	2	2	.	.	.	.	3	7
<i>Nicholsina usta</i>	.	.	.	.	.	.	4	1	5
<i>Notropis maculatus</i>	.	.	.	4	.	.	.	.	4
<i>Notropis</i> spp.	.	.	.	1	1	.	.	.	2
<i>Noturus</i> sp.	.	.	.	1	.	.	.	.	1
<i>Ocyurus chrysurus</i>	3	.	.	.	.	.	2	1	6
<i>Oligoplites saurus</i>	34	25	207	11	4	94	47	.	422
<i>Opisthonema oglinum</i>	143	30	163	2	.	85	312	.	735
<i>Opsanus tau</i>	4	.	3	.	.	6	4	2	19
<i>Oreochromis aureus</i>	.	.	.	.	1	.	.	.	1
<i>Oreochromis</i> spp.	.	.	.	.	12	.	.	.	12
<i>Orthopristis chrysoptera</i>	125	1	195	1	6	232	196	123	879
<i>Ostraciidae</i> spp.	.	.	.	3	.	.	.	3	6
<i>Paralichthys albigutta</i>	1	.	1	.	.	27	10	4	43
<i>Paralichthys lethostigma</i>	.	.	.	2	.	1	1	.	4
<i>Poecilia latipinna</i>	7	2	843	13	140	.	.	.	1,005
<i>Pogonias cromis</i>	.	.	2	.	.	109	20	.	131
<i>Pomadasyd crocro</i>	.	.	.	1	.	.	.	.	1

Appendix IR07-02. (Continued)

Species	Gear and Strata								Totals E=923
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl E=96	
	Veg E=111	Unveg E=53	Shore E=216	Over E=158	Nonover E=59	Over E=163	Nonover E=67		
<i>Pomatomus saltatrix</i>	.	.	.	.	1	3	5	.	9
<i>Portunus</i> spp.	.	.	.	.	.	.	.	16	16
<i>Prionotus scitulus</i>	.	.	2	.	.	5	15	4	26
<i>Prionotus tribulus</i>	.	.	3	.	1	9	2	9	24
<i>Pseudemys nelsoni</i>	.	.	.	1	.	.	.	.	1
<i>Pseudemys peninsularis</i>	.	.	.	3	.	.	.	.	3
<i>Pterygoplichthys</i> spp.	.	.	.	2	.	.	.	.	2
<i>Rimapenaeus constrictus</i>	.	.	.	.	.	.	.	2	2
<i>Sarotherodon melanotheron</i>	.	.	4	.	2	26	3	.	35
<i>Sciaenops ocellatus</i>	101	1	508	23	80	281	63	27	1,084
<i>Scomberomorus maculatus</i>	1	.	.	.	.	11	9	.	21
<i>Scomberomorus regalis</i>	.	.	.	.	.	.	1	.	1
<i>Scorpaena grandicornis</i>	.	.	1	.	.	.	1	.	2
<i>Selene vomer</i>	.	.	1	1	.	127	62	1	192
<i>Sphoeroides nephelus</i>	35	11	49	21	18	831	586	43	1,594
<i>Sphoeroides spengleri</i>	1	.	1	.	1	5	3	5	16
<i>Sphoeroides testudineus</i>	8	2	34	10	35	120	66	29	304
<i>Sphyraena barracuda</i>	1	.	14	10	7	22	12	2	68
<i>Sphyraena guachancho</i>	1	.	.	.	.	.	.	.	1
<i>Sphyrna tiburo</i>	.	.	.	.	.	4	.	.	4
<i>Stephanolepis hispidus</i>	2	.	.	4	.	.	9	11	26
<i>Strongylura marina</i>	.	.	3	9	2	9	13	.	36
<i>Strongylura notata</i>	66	28	486	47	37	118	18	.	800
<i>Strongylura</i> spp.	.	.	10	16	8	.	.	.	34
<i>Strongylura timucu</i>	.	.	3	2	9	.	.	.	14
<i>Symphurus plagiusa</i>	.	.	4	.	.	2	1	3	10
<i>Syngnathus louisianae</i>	24	3	18	1	1	2	.	19	68
<i>Syngnathus scovelli</i>	233	35	358	5	17	.	.	273	921
<i>Synodus foetens</i>	1	.	.	.	1	6	1	7	16
<i>Tilapia mariae</i>	.	.	.	26	17	.	.	.	43
<i>Trachinotus carolinus</i>	.	.	7	.	2	7	3	.	19
<i>Trachinotus falcatus</i>	.	.	55	3	13	122	40	.	233
<i>Trinectes maculatus</i>	.	.	2	76	26	1	.	.	105
<i>Tylosurus acus</i>	.	.	.	1	.	.	.	.	1
Totals	35,196	22,831	190,905	123,284	36,981	23,540	10,503	6,050	449,290

Appendix IR07-03

Summary by zone of species collected during northern Indian River Lagoon stratified-random sampling, 2007. Zones A-C and H were located in the Indian River; Zones D-E encompassed the Banana River; and Zones F and O encompassed the lower Sebastian River and Turkey Creek, respectively. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Zone								Totals
	A	B	C	D	E	H	F	O	
	E=16	E=14	E=170	E=168	E=62	E=276	E=168	E=49	
<i>Acanthostracion quadricornis</i>	.	.	.	1	.	3	.	.	4
<i>Achiridae</i> sp.	.	.	.	.	.	.	1	.	1
<i>Achirus lineatus</i>	1	.	15	11	15	45	27	5	119
<i>Agonostomus monticola</i>	.	.	.	.	.	.	8	7	15
<i>Albula vulpes</i>	.	.	9	6	.	24	2	.	41
<i>Aluterus schoepfii</i>	.	.	.	1	.	2	.	.	3
<i>Amia calva</i>	.	.	.	.	.	.	2	.	2
<i>Anchoa hepsetus</i>	.	.	162	4	.	123	20	.	309
<i>Anchoa mitchilli</i>	818	2,985	117,410	1,448	10,432	43,708	106,680	17,280	300,761
<i>Anchoa</i> spp.	.	.	.	.	.	.	4	.	4
<i>Anisotremus virginicus</i>	.	.	.	.	.	1	.	.	1
<i>Apalone ferox</i>	.	.	.	.	.	.	.	1	1
<i>Archosargus probatocephalus</i>	1	.	239	187	43	842	112	15	1,439
<i>Archosargus rhomboidalis</i>	.	.	1	.	.	27	.	.	28
<i>Archosargus</i> spp.	.	.	.	.	.	2	.	.	2
<i>Ariopsis felis</i>	4	36	545	518	779	1,404	12	5	3,303
<i>Astroscopus y-graecum</i>	.	.	.	.	.	1	.	.	1
<i>Bagre marinus</i>	.	.	23	.	.	23	.	.	46
<i>Bairdiella chrysoura</i>	30	47	2,367	659	329	1,155	22	1	4,610
<i>Bairdiella sanctaeluciae</i>	.	.	.	.	.	13	.	.	13
<i>Bathygobius soporator</i>	.	.	.	.	.	1	6	.	7
<i>Brevoortia</i> spp.	.	.	54	181	41	193	2,429	124	3,022
<i>Calamus arctifrons</i>	.	.	.	.	.	7	.	.	7
<i>Callinectes sapidus</i>	1	.	47	72	19	1,022	588	27	1,776
<i>Callinectes similis</i>	.	.	.	.	.	219	9	.	228
<i>Callinectes</i> spp.	.	.	.	.	.	1	1	.	2

Appendix IR07-03 (Continued)

Species	Zone								Totals
	A	B	C	D	E	H	F	O	
	E=16	E=14	E=170	E=168	E=62	E=276	E=168	E=49		E=923
<i>Canthidermis maculata</i>	.	.	.	.	.	1	.	.	1
<i>Caranx hippos</i>	.	.	20	43	3	89	11	.	166
<i>Caranx latus</i>	.	.	2	.	.	2	.	.	4
<i>Centropomus parallelus</i>	.	.	.	.	.	.	24	.	24
<i>Centropomus pectinatus</i>	.	.	.	.	.	.	11	.	11
<i>Centropomus sp.</i>	.	.	.	.	.	.	.	1	1
<i>Centropomus undecimalis</i>	.	.	43	56	14	249	1,182	98	1,642
<i>Chaetodipterus faber</i>	.	.	83	6	2	19	.	.	110
<i>Chasmodes saburrae</i>	3	2	43	21	6	31	.	.	106
<i>Chilomycterus schoepfii</i>	1	.	37	27	9	163	.	.	237
<i>Chloroscombrus chrysurus</i>	.	.	8	.	.	21	.	.	29
<i>Cichlidae sp.</i>	.	.	.	1	.	.	.	.	1
<i>Citharichthys spilopterus</i>	.	.	1	.	.	81	56	.	138
<i>Clupeidae spp.</i>	.	.	1	.	.	2	4	.	7
<i>Coryphaena hippurus</i>	.	.	.	.	.	.	1	.	1
<i>Ctenogobius boleosoma</i>	.	.	.	.	.	147	43	1	191
<i>Ctenogobius pseudofasciatus</i>	.	.	.	.	.	.	5	.	5
<i>Ctenogobius shufeldti</i>	.	.	.	.	.	1	23	.	24
<i>Ctenogobius smaragdus</i>	.	.	.	.	.	6	.	.	6
<i>Ctenogobius spp.</i>	.	.	.	.	.	1	1	.	2
<i>Ctenogobius stigmaticus</i>	.	.	.	.	.	2	.	.	2
<i>Cynoscion nebulosus</i>	22	62	159	70	69	254	5	.	641
<i>Cynoscion complex</i>	.	.	38	.	.	39	2	.	79
<i>Cyprinodon variegatus</i>	161	2	190	122	42	21	.	.	538
<i>Dasyatis sabina</i>	4	4	374	496	241	461	9	.	1,589
<i>Dasyatis say</i>	1	.	31	25	31	41	.	.	129
<i>Diapterus auratus</i>	67	9	2,566	883	671	4,125	8,407	1,094	17,822
<i>Diplodus holbrookii</i>	.	.	.	.	.	4	.	.	4
<i>Dormitator maculatus</i>	.	.	.	.	.	.	2	2	4
<i>Dorosoma cepedianum</i>	.	.	.	.	.	.	.	1	1
<i>Echeneis naucrates</i>	.	.	.	1	.	.	.	.	1
<i>Elops saurus</i>	5	1	71	450	67	374	5	2	975
<i>Epinephelus itajara</i>	.	.	.	.	.	1	.	.	1
<i>Eucinostomus argenteus</i>	.	.	.	.	.	28	.	.	28

Appendix IR07-03 (Continued)

Species	Zone								Totals
	A	B	C	D	E	H	F	O	
	E=16	E=14	E=170	E=168	E=62	E=276	E=168	E=49	E=923
<i>Eucinostomus gula</i>	.	.	28	77	39	1,715	118	.	1,977
<i>Eucinostomus harengulus</i>	41	.	271	1,151	98	1,012	1,998	175	4,746
<i>Eucinostomus jonesii</i>	.	.	.	.	.	36	3	.	39
<i>Eucinostomus</i> spp.	172	3	439	224	23	6,448	10,756	345	18,410
<i>Eugerres plumieri</i>	.	2	7	.	4	1	1,390	152	1,556
<i>Evorthodus lyricus</i>	.	.	.	1	.	1	59	.	61
<i>Farfantepenaeus aztecus</i>	.	.	3	.	.	4	2	.	9
<i>Farfantepenaeus brasiliensis</i>	.	.	.	.	.	1	.	.	1
<i>Farfantepenaeus duorarum</i>	1	.	23	1	1	188	18	5	237
<i>Farfantepenaeus</i> spp.	1	.	33	.	.	973	695	7	1,709
<i>Floridichthys carpio</i>	224	226	302	2,635	46	25	.	.	3,458
<i>Fundulus grandis</i>	4	.	7	2	.	6	2	.	21
<i>Fundulus seminolis</i>	.	.	.	.	.	.	.	20	20
<i>Gambusia holbrooki</i>	291	.	3	30	.	.	934	249	1,507
<i>Gerres cinereus</i>	.	.	4	.	.	76	5	4	89
<i>Gobiesox strumosus</i>	.	.	1	.	.	2	.	.	3
<i>Gobiomorus dormitor</i>	.	.	.	.	.	.	1	.	1
<i>Gobionellus oceanicus</i>	.	.	.	.	.	8	42	5	55
<i>Gobiosoma bosc</i>	.	.	.	.	.	.	70	32	102
<i>Gobiosoma ginsburgi</i>	.	.	.	.	.	1	.	.	1
<i>Gobiosoma robustum</i>	57	25	715	207	5	1,026	109	8	2,152
<i>Gobiosoma</i> spp.	67	63	510	133	62	1,326	112	113	2,386
<i>Gymnura micrura</i>	.	.	1	.	.	9	.	.	10
<i>Haemulon aurolineatum</i>	.	.	.	.	.	2	.	.	2
<i>Haemulon parra</i>	.	.	.	.	.	59	.	.	59
<i>Haemulon plumierii</i>	.	.	.	.	.	10	.	.	10
<i>Haemulon sciurus</i>	.	.	.	.	.	2	.	.	2
<i>Harengula jaguana</i>	.	.	171	35	8	1,086	40	.	1,340
<i>Hemichromis letourneuxi</i>	.	.	.	.	.	.	3	.	3
<i>Heterandria formosa</i>	.	.	.	.	.	.	.	5	5
<i>Hippocampus erectus</i>	.	.	3	.	2	8	.	.	13
<i>Hippocampus zosterae</i>	.	.	1	9	1	6	.	.	17
<i>Hirundichthys</i> sp.	.	.	.	.	.	.	1	.	1
<i>Histrio histrio</i>	.	.	.	.	.	.	2	.	2

Appendix IR07-03 (Continued)

Species	Zone								Totals
	A	B	C	D	E	H	F	O	
	E=16	E=14	E=170	E=168	E=62	E=276	E=168	E=49	E=923
<i>Hyporhamphus meeki</i>	.	.	2	26	7	37	.	.	72
<i>Hyporhamphus</i> spp.	2	.	.	4	.	.	.	.	6
<i>Hyporhamphus unifasciatus</i>	.	.	.	1	.	.	.	.	1
<i>Jordanella floridae</i>	1	1
<i>Labidesthes sicculus</i>	47	189	236
<i>Lactophrys trigonus</i>	.	.	1	.	.	3	.	.	4
<i>Lagodon rhomboides</i>	1	.	385	705	74	5,875	31	.	7,071
<i>Leiostomus xanthurus</i>	.	.	11	33	28	157	65	1	295
<i>Lepisosteus platyrhincus</i>	1	.	.	.	.	.	3	3	7
<i>Lepomis auritus</i>	9	9
<i>Lepomis gulosus</i>	1	1
<i>Lepomis macrochirus</i>	6	40	46
<i>Lepomis microlophus</i>	11	11
<i>Lepomis punctatus</i>	1	3	4
<i>Lepomis</i> spp.	10	70	80
<i>Limulus polyphemus</i>	.	.	6	4	6	.	.	.	16
<i>Litopenaeus setiferus</i>	.	.	12	1	.	283	154	11	461
<i>Lobotes surinamensis</i>	1	.	1
<i>Lophogobius cyprinoides</i>	1	227	2	230
<i>Lucania goodei</i>	16	16
<i>Lucania parva</i>	1,375	945	2,572	16,213	501	437	115	59	22,217
<i>Lupinoblennius nicholsi</i>	8	2	10
<i>Lutjanus analis</i>	79	.	.	79
<i>Lutjanus griseus</i>	.	.	41	15	21	177	56	5	315
<i>Lutjanus jocu</i>	2	5	.	7
<i>Lutjanus synagris</i>	80	.	.	80
<i>Malaclemys terrapin</i>	.	.	1	.	2	.	.	.	3
<i>Megalops atlanticus</i>	.	.	.	1	.	.	.	.	1
<i>Membras martinica</i>	.	15	117	19	4	1	.	.	156
<i>Menidia</i> spp.	512	14	1,300	11,081	280	190	848	130	14,355
<i>Menippe</i> spp.	.	.	1	.	.	1	.	.	2
<i>Menticirrhus americanus</i>	.	13	207	6	29	85	.	.	340
<i>Microgobius gulosus</i>	532	133	695	2,051	786	1,195	143	163	5,698
<i>Microgobius microlepis</i>	1	.	.	1

Appendix IR07-03 (Continued)

Species	Zone								Totals
	A	B	C	D	E	H	F	O	
	E=16	E=14	E=170	E=168	E=62	E=276	E=168	E=49	E=923
<i>Microgobius thalassinus</i>	.	.	19	.	.	23	20	.	62
<i>Microphis brachyurus</i>	8	2	10
<i>Micropogonias undulatus</i>	.	.	6	.	17	555	301	3	882
<i>Micropterus salmoides</i>	2	5	7
<i>Mugil cephalus</i>	7	3	443	1,535	481	727	79	14	3,289
<i>Mugil curema</i>	9	3	920	1,047	624	509	644	150	3,906
<i>Mugil gyrans</i>	1	.	1
<i>Mycteroperca bonaci</i>	2	.	.	2
<i>Mycteroperca microlepis</i>	16	.	.	16
<i>Myrophis punctatus</i>	7	.	.	7
<i>Nicholsina usta</i>	5	.	.	5
<i>Notropis maculatus</i>	4	.	4
<i>Notropis</i> spp.	2	2
<i>Noturus</i> sp.	1	.	1
<i>Ocyurus chrysurus</i>	6	.	.	6
<i>Oligoplites saurus</i>	8	13	228	29	40	89	3	12	422
<i>Opisthonema oglinum</i>	.	.	349	35	12	337	2	.	735
<i>Opsanus tau</i>	.	.	4	1	2	12	.	.	19
<i>Oreochromis aureus</i>	1	1
<i>Oreochromis</i> spp.	12	12
<i>Orthopristis chrysoptera</i>	.	.	47	18	18	789	7	.	879
<i>Ostraciidae</i> spp.	3	3	.	6
<i>Paralichthys albigutta</i>	43	.	.	43
<i>Paralichthys lethostigma</i>	2	2	.	4
<i>Poecilia latipinna</i>	368	1	324	151	.	8	112	41	1,005
<i>Pogonias cromis</i>	.	1	27	61	3	39	.	.	131
<i>Pomadasys crocro</i>	1	.	1
<i>Pomatomus saltatrix</i>	.	.	3	.	1	4	1	.	9
<i>Portunus</i> spp.	16	.	.	16
<i>Prionotus scitulus</i>	.	.	16	5	1	4	.	.	26
<i>Prionotus tribulus</i>	.	.	2	.	1	20	1	.	24
<i>Pseudemys nelsoni</i>	1	.	1
<i>Pseudemys peninsularis</i>	2	1	3
<i>Pterygoplichthys</i> spp.	2	.	2

Appendix IR07-03 (Continued)

Species	Zone								Totals
	A	B	C	D	E	H	F	O	
	E=16	E=14	E=170	E=168	E=62	E=276	E=168	E=49	E=923
<i>Rimapenaeus constrictus</i>	2	.	.	2
<i>Sarotherodon melanotheron</i>	.	.	2	30	1	.	2	.	35
<i>Sciaenops ocellatus</i>	2	.	45	168	87	679	103	.	1,084
<i>Scomberomorus maculatus</i>	.	.	7	.	.	14	.	.	21
<i>Scomberomorus regalis</i>	1	.	.	1
<i>Scorpaena grandicornis</i>	2	.	.	2
<i>Selene vomer</i>	.	.	4	3	1	183	1	.	192
<i>Sphoeroides nephelus</i>	4	4	368	667	220	292	39	.	1,594
<i>Sphoeroides spengleri</i>	.	.	.	3	.	12	.	1	16
<i>Sphoeroides testudineus</i>	.	.	4	.	.	255	45	.	304
<i>Sphyræna barracuda</i>	.	.	3	.	1	47	16	1	68
<i>Sphyræna guachancho</i>	1	.	.	1
<i>Sphyrna tiburo</i>	4	.	.	4
<i>Stephanolepis hispidus</i>	.	.	.	5	.	17	4	.	26
<i>Strongylura marina</i>	.	.	3	3	3	16	6	5	36
<i>Strongylura notata</i>	9	11	195	367	44	90	66	18	800
<i>Strongylura spp.</i>	.	1	1	6	1	1	23	1	34
<i>Strongylura timucu</i>	3	9	2	14
<i>Symphurus plagiusa</i>	10	.	.	10
<i>Syngnathus louisianae</i>	.	.	17	7	4	38	2	.	68
<i>Syngnathus scovelli</i>	23	26	198	173	14	465	21	1	921
<i>Synodus foetens</i>	15	1	.	16
<i>Tilapia mariae</i>	23	20	43
<i>Trachinotus carolinus</i>	.	.	10	1	4	2	2	.	19
<i>Trachinotus falcatus</i>	.	.	43	108	4	62	16	.	233
<i>Trinectes maculatus</i>	.	.	2	1	.	.	51	51	105
<i>Tylosurus acus</i>	1	.	1
Totals	4,830	4,650	135,702	44,378	16,424	83,041	139,422	20,843	449,290

Cedar Key

Cedar Key is in the Suwannee River estuary, an open system located along the Gulf Coast of Florida within the area known as the Big Bend. Freshwater inflow into the estuary comes primarily from the Suwannee River with additional input from many fringing marsh tidal creeks (Lindberg et al. 1992). The shoreline consists largely of marsh grasses, oyster bars, and mud flats. Seagrass meadows primarily occur in the southern portions of the estuary (Tuckey and Dehaven 2006).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling in the Cedar Key area since 1996. The area sampled was divided into two geographically-defined bay zones (B and C) and one riverine zone (F; Figure CK07-01). Monthly stratified-random sampling (SRS) was conducted in Zones B and C using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Zone B was also sampled using 21.3-m river seines. Monthly SRS was conducted in Zone F with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in the Cedar Key area.

Stratified-Random Sampling

A total of 207,048 fishes (139 taxa) and selected invertebrates (seven taxa) were collected from 792 Cedar Key SRS samples in 2007 (Table CK07-01; Appendices CK07-01 and -02). *Anchoa mitchilli* (n=117,989) was the most numerous species collected, representing 57.0% of the total catch. *Lagodon rhomboides* (n=18,606) and *Leiostomus xanthurus* (n=16,041) were the second- and third-most abundant taxa collected, accounting for an additional 16.7% of the total catch. Twenty-six Selected Taxa (n=27,491 animals) composed 13.3% of the total catch. *Leiostomus xanthurus* (n=16,041) was the most abundant Selected Taxon, representing 7.7% of the annual catch. Collections in 2007 included two species new to the Cedar Key FIM collection: *Equetus lanceolatus* (jackknife fish) and *Etropus cyclosquamus* (shelf flounder).

Bay Sampling

21.3-m Bay Seine. A total of 60,003 animals were collected in 252 21.3-m bay seines, representing 29.0% of the overall SRS catch (Table CK07-01). *Anchoa mitchilli* (n=36,870) was the most abundant taxon, accounting for 61.4% of the 21.3-m bay seine catch (Table CK07-02). The taxa most frequently caught in 21.3-m bay seines were *L. rhomboides* (56.7% occurrence) and *A. mitchilli* (52.8% occurrence).

A total of 6,671 animals from 22 Selected Taxa were collected, representing 11.1% of the entire 21.3-m bay seine catch (Table CK07-03). *Leiostomus xanthurus* (n=4,682) was the most abundant Selected Taxon, accounting for 70.2% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m bay seines was *Callinectes sapidus* (32.5% occurrence).

183-m Haul Seine. A total of 31,740 animals were collected in 192 183-m haul seines, representing 15.3% of the overall SRS catch (Table CK07-01). *Lagodon rhomboides* (n=10,378), *Bairdiella chrysoura* (n=6,439) and *L. xanthurus* (n=3,561) were the most abundant taxa, accounting for 64.2% of the 183-m haul seine catch (Table CK07-04). The taxa most frequently caught in 183-m haul seines were *Mugil cephalus* (78.1% occurrence) and *L. rhomboides* (77.1% occurrence).

A total of 8,856 animals from 24 Selected Taxa were collected, representing 27.9% of the entire 183-m haul seine catch (Table CK07-05). *Leiostomus xanthurus* (n=3,561) and *M. cephalus* (n=2,388) were the most abundant Selected Taxa, accounting for 67.2% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 183-m haul seines was *M. cephalus* (78.1% occurrence).

6.1-m Bay Otter Trawl. A total of 19,483 animals were collected in 120 6.1-m bay otter trawls, representing 9.4% of the overall SRS catch (Table CK07-01). *Anchoa mitchilli* (n=8,744), was the most abundant taxon, accounting for 44.9% of the 6.1-m bay otter trawl catch (Table CK07-06). The taxon most frequently caught in 6.1-m bay otter trawls was *Prionotus scitulus* (66.7% occurrence).

A total of 1,797 animals from 13 Selected Taxa were collected, representing 9.2% of the entire 6.1-m bay otter trawl catch (Table CK07-07). *Leiostomus xanthurus* (n=570) and *Cynoscion arenarius* (n=426) were the most abundant Selected Taxa,

accounting for 55.4% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 6.1-m bay otter trawls was *Menippe* spp. (41.7% occurrence).

River Sampling

River Sampling occurred in tidal creeks (Zone B) with the deployment of 108 21.3-m river seines and in the lower Suwannee River (LSR; Zone F) with the deployment of 60 21.3-m river seines and 60 6.1-m river otter trawls.

Tidal Creeks

21.3-m River Seines. A total of 67,257 animals were collected in 108 21.3-m river seines conducted in tidal creeks, representing 32.5% of the overall SRS catch (Table CK07-01). *Anchoa mitchilli* (n=56,644) was the most abundant taxon collected, accounting for 84.2% of the total 21.3-m river seine catch in tidal creeks (Table CK07-08). The taxa most frequently caught in 21.3-m river seines conducted in tidal creeks were *A. mitchilli* (75.0% occurrence) and *Menidia* spp. (73.1% occurrence).

A total of 3,979 animals from 17 Selected Taxa were collected, representing 5.9% of the entire 21.3-m river seine catch in tidal creeks (Table CK07-09). *Leiostomus xanthurus* (n=3,017) was the most abundant Selected Taxon, accounting for 75.8% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m river seines conducted in tidal creeks was *L. xanthurus* (51.9% occurrence).

Lower Suwannee River

21.3-m River Seines. A total of 12,616 animals were collected in 60 21.3-m river seine samples conducted in the LSR, representing 6.1% of the overall SRS catch (Table CK07-01). *Leiostomus xanthurus* (n=3,792) and *A. mitchilli* (n=3,226) were the most abundant taxa collected, accounting for 55.6% of the total 21.3-m river seine catch in the LSR (Table CK07-10). The taxa most frequently caught in 21.3-m river seines conducted in the LSR were *Menidia* spp. (66.7% occurrence) and *L. rhomboides* (63.3% occurrence).

A total of 4,380 animals from 15 Selected Taxa were collected, representing 34.7% of the entire 21.3-m river seine catch in the LSR (Table CK07-11). *Leiostomus*

xanthurus (n=3,792), was the most abundant Selected Taxon, accounting for 86.6% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m river seines conducted in the LSR was *C. sapidus* (48.3% occurrence).

6.1-m River Otter Trawl. A total of 15,949 animals were collected in 60 6.1-m river otter trawls, representing 7.7% of the overall SRS catch (Table CK07-01). *Anchoa mitchilli* (n=12,505) was the most abundant taxon collected, accounting for 78.4% of the 6.1-m river otter trawl catch (Table CK07-12). The taxon most frequently caught in 6.1-m river otter trawls was *C. sapidus* (78.3% occurrence).

A total of 1,808 animals from 15 Selected Taxa were collected, representing 11.3% of the entire 6.1-m river otter trawl catch (Table CK07-13). *Callinectes sapidus* (n=480), *Farfantepenaeus duorarum* (n=455), and *L. xanthurus* (n=419) were the most abundant Selected Taxa, accounting for 74.9% of the Selected Taxa captured with this gear. The Selected Taxon most frequently caught in 6.1-m river otter trawls was *C. sapidus* (78.3% occurrence).

References

Lindberg, W.J., T.M. Bert, and G.P. Genoni. 1992. Alternative hypotheses for low landings in the Cedar Key stone crab (genus *Menippe*) fishery, 1984-85, pp. 50-57. *In* Proceedings of a workshop on stone crab (genus *Menippe*) biology and fisheries. Fla. Mar. Res. Publ. No. 50.

Tuckey, T. D. and M. Dehaven. 2006. Fish assemblages found in tidal-creek and Seagrass habitats in the Suwannee River Estuary. *Fish. Bull.* 104(1):102-117.

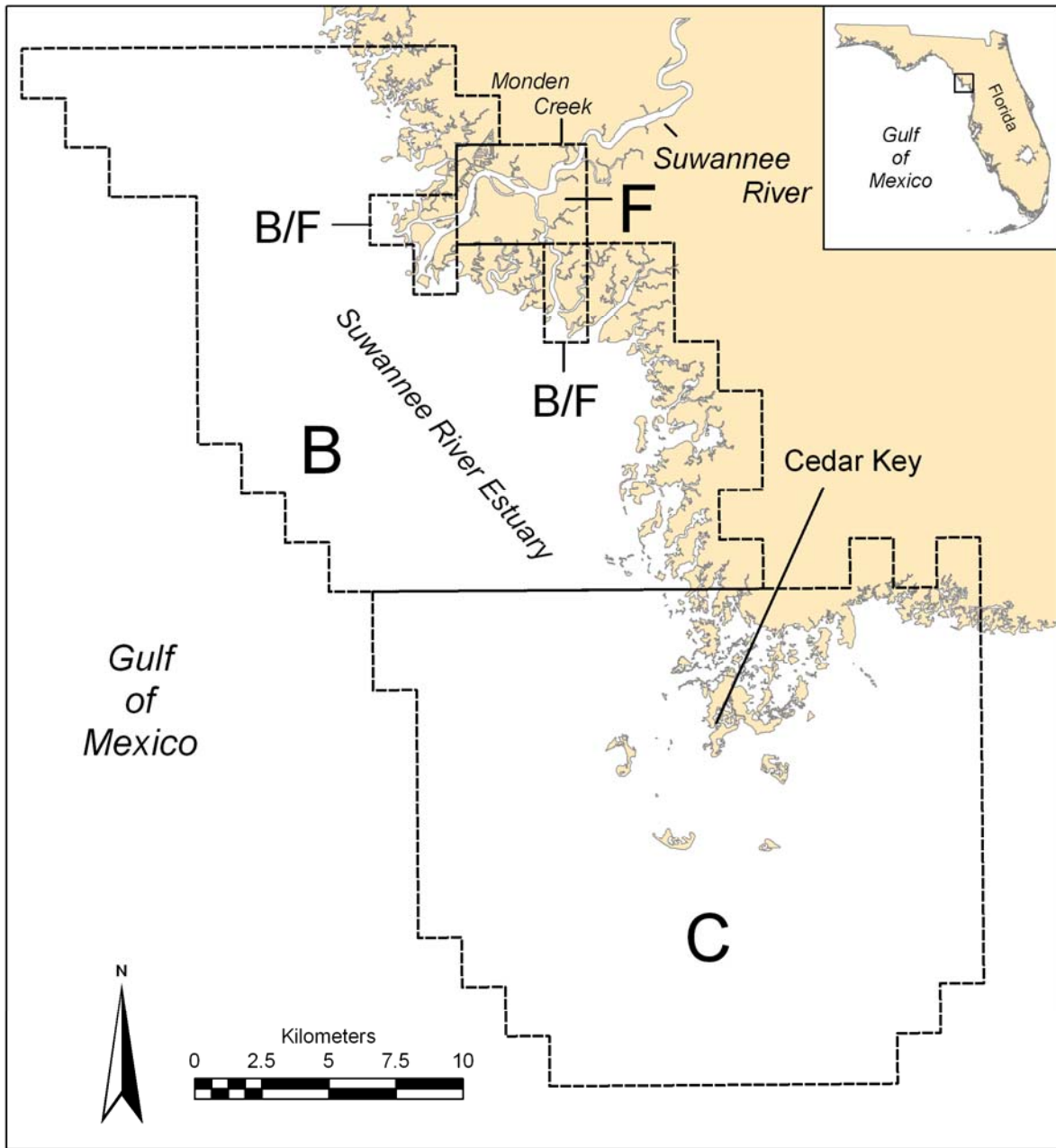


Figure CK07-01. Map of Cedar Key sampling area. Zones are labeled B, C, and F. Grids containing portions of Zones B and F are labeled B/F.

Table CK07-01. Summary of catch and effort data for Cedar Key stratified-random sampling, 2007.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
B	43,525	120	67,257	108	14,556	96	12,931	60	138,269	384
C	16,478	132	.	.	17,184	96	6,552	60	40,214	288
F	.	.	12,616	60	.	.	15,949	60	28,565	120
Totals	60,003	252	79,873	168	31,740	192	35,432	180	207,048	792

Table CK07-02. Catch statistics for 10 dominant taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	36,870	61.4	52.8	104.51	47.62	723.38	11,037.14	33	0.05	15	84
<i>Lagodon rhomboides</i>	5,281	8.8	56.7	14.97	3.53	374.75	524.29	41	0.29	11	152
<i>Leiostomus xanthurus</i>	4,682	7.8	26.2	13.27	4.09	489.47	718.57	21	0.19	9	170
<i>Membras martinica</i>	2,317	3.9	24.6	6.57	2.56	618.26	539.29	45	0.36	20	85
<i>Menidia</i> spp.	1,579	2.6	33.7	4.48	0.91	324.15	101.43	62	0.38	22	103
<i>Ariopsis felis</i>	1,261	2.1	12.3	3.57	2.27	1,006.99	557.86	72	1.00	42	312
<i>Orthopristis chrysoptera</i>	1,095	1.8	21.0	3.10	1.10	560.73	220.71	40	0.66	12	145
<i>Eucinostomus</i> spp.	1,039	1.7	24.6	2.95	0.95	511.10	192.14	26	0.21	8	40
<i>Harengula jaguana</i>	896	1.5	9.9	2.54	1.88	1,172.70	469.29	54	0.40	22	118
<i>Bairdiella chrysoura</i>	700	1.2	15.1	1.98	0.89	714.52	151.43	54	1.31	9	164
Subtotal	55,720	92.8	.	.	.	.	.	.	.	8	312
Totals	60,003	100.0	.	170.08	48.37	451.49	11,124.29	.	.	3	687

Table CK07-03. Catch statistics for Selected Taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	4,682	7.8	26.2	13.27	4.09	489.47	718.57	21	0.19	9	170
<i>Callinectes sapidus</i>	608	1.0	32.5	1.72	0.50	459.54	105.71	19	0.73	4	166
<i>Farfantepenaeus duorarum</i>	432	0.7	28.6	1.22	0.23	302.45	31.43	10	0.19	3	28
<i>Menticirrhus americanus</i>	279	0.5	20.2	0.79	0.19	382.70	38.57	51	2.14	10	260
<i>Cynoscion arenarius</i>	207	0.3	15.1	0.59	0.14	391.43	23.57	30	0.94	10	95
<i>Mugil cephalus</i>	133	0.2	13.5	0.38	0.14	580.60	30.71	78	6.64	20	345
<i>Sciaenops ocellatus</i>	83	0.1	12.7	0.24	0.07	481.65	14.29	80	12.11	12	468
<i>Paralichthys albigutta</i>	68	0.1	14.3	0.19	0.04	325.51	5.00	60	5.45	13	236
<i>Pogonias cromis</i>	56	0.1	3.6	0.16	0.11	1,057.27	25.71	137	4.00	60	186
<i>Cynoscion nebulosus</i>	50	0.1	9.1	0.14	0.05	593.52	12.14	50	5.19	13	162
<i>Menticirrhus saxatilis</i>	23	0.0	3.6	0.07	0.03	629.67	4.29	42	3.77	11	80
<i>Archosargus probatocephalus</i>	9	0.0	2.4	0.03	0.01	803.68	2.86	114	51.02	14	370
<i>Mugil curema</i>	8	0.0	2.0	0.02	0.01	788.97	2.14	93	16.79	28	160
<i>Mugil gyrans</i>	8	0.0	1.2	0.02	0.02	1,084.40	3.57	56	19.34	16	144
<i>Lutjanus griseus</i>	7	0.0	2.0	0.02	0.01	746.95	1.43	50	20.59	19	172
<i>Mycteroperca microlepis</i>	4	0.0	1.2	0.01	0.01	968.88	1.43	144	10.96	128	175
<i>Elops saurus</i>	4	0.0	0.8	0.01	0.01	1,253.49	2.14	193	51.96	38	258

Table CK07-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Scomberomorus maculatus</i>	3	0.0	0.8	0.01	0.01	1,181.33	1.43	40	9.61	21	52
<i>Trachinotus falcatus</i>	3	0.0	0.4	0.01	0.01	1,587.45	2.14	48	1.33	47	51
<i>Pomatomus saltatrix</i>	2	0.0	0.4	0.01	0.01	1,587.45	1.43	92	0.00	92	92
<i>Lutjanus synagris</i>	1	0.0	0.4	0.00	0.00	1,587.45	0.71	35	.	35	35
<i>Paralichthys lethostigma</i>	1	0.0	0.4	0.00	0.00	1,587.45	0.71	70	.	70	70
Totals	6,671	11.1	77.4	18.91	4.18	350.82	726.43	.	.	3	468

Table CK07-04. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	10,378	32.7	77.1	54.05	7.58	194.25	638.00	92	0.22	20	218
<i>Bairdiella chrysoura</i>	6,439	20.3	35.4	33.54	18.10	748.04	3,382.00	120	0.25	40	185
<i>Leiostomus xanthurus</i>	3,561	11.2	44.3	18.55	5.39	402.32	919.00	106	0.62	52	247
<i>Mugil cephalus</i>	2,388	7.5	78.1	12.44	2.77	308.52	466.00	226	1.51	17	409
<i>Dasyatis sabina</i>	1,548	4.9	71.9	8.06	1.02	174.62	104.00	230	1.28	93	486
<i>Orthopristis chrysoptera</i>	1,030	3.2	22.9	5.36	1.32	339.75	115.00	91	0.80	35	188
<i>Elops saurus</i>	734	2.3	46.4	3.82	0.76	274.77	101.00	264	1.94	130	650
<i>Brevoortia</i> spp.	563	1.8	17.7	2.93	1.21	572.91	188.00	92	1.11	33	203
<i>Ariopsis felis</i>	475	1.5	38.5	2.47	0.56	316.41	85.00	238	2.76	28	381
<i>Harengula jaguana</i>	416	1.3	20.3	2.17	0.63	402.59	96.00	104	0.92	64	180
Subtotal	27,532	86.7	.	.	.	.	.	.	.	17	650
Totals	31,740	100.0	.	165.31	21.60	181.06	3,532.00	.	.	11	1200

Table CK07-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	3,561	11.2	44.3	18.55	5.39	402.32	919.00	106	0.62	52	247
<i>Mugil cephalus</i>	2,388	7.5	78.1	12.44	2.77	308.52	466.00	226	1.51	17	409
<i>Elops saurus</i>	734	2.3	46.4	3.82	0.76	274.77	101.00	264	1.94	130	650
<i>Mugil curema</i>	373	1.2	28.1	1.94	0.51	366.00	70.00	148	1.63	98	286
<i>Callinectes sapidus</i>	319	1.0	34.9	1.66	0.40	333.07	51.00	96	2.41	28	190
<i>Sciaenops ocellatus</i>	317	1.0	33.9	1.65	0.29	241.86	30.00	355	7.07	75	875
<i>Pogonias cromis</i>	283	0.9	19.8	1.47	0.49	457.46	74.00	349	19.07	75	947
<i>Paralichthys albigutta</i>	208	0.7	37.0	1.08	0.18	230.66	18.00	124	4.32	48	347
<i>Archosargus probatocephalus</i>	156	0.5	21.9	0.81	0.22	380.68	34.00	311	6.16	110	458
<i>Cynoscion nebulosus</i>	150	0.5	28.6	0.78	0.14	256.81	18.00	214	7.43	94	503
<i>Menticirrhus americanus</i>	105	0.3	19.8	0.55	0.11	276.14	11.00	149	5.57	65	300
<i>Cynoscion arenarius</i>	66	0.2	7.3	0.34	0.22	885.41	41.00	234	5.58	71	295
<i>Mugil gyrans</i>	53	0.2	5.2	0.28	0.19	932.06	35.00	127	3.54	90	239
<i>Farfantepenaeus duorarum</i>	39	0.1	9.9	0.20	0.05	372.04	6.00	21	0.98	11	44
<i>Scomberomorus maculatus</i>	32	0.1	8.3	0.17	0.07	573.77	12.00	295	17.02	100	468
<i>Pomatomus saltatrix</i>	19	0.1	6.8	0.10	0.03	445.49	4.00	176	19.51	108	440
<i>Lutjanus griseus</i>	17	0.1	5.2	0.09	0.03	526.42	4.00	132	8.84	53	168

Table CK07-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Micropogonias undulatus</i>	17	0.1	2.1	0.09	0.05	773.10	7.00	167	4.04	130	190
<i>Mycteroperca microlepis</i>	5	0.0	2.1	0.03	0.01	728.26	2.00	134	13.15	94	166
<i>Trachinotus falcatus</i>	5	0.0	1.6	0.03	0.02	916.06	3.00	106	22.69	45	149
<i>Menippe</i> spp.	2	0.0	1.0	0.01	0.01	977.23	1.00	36	18.00	18	54
<i>Paralichthys lethostigma</i>	2	0.0	1.0	0.01	0.01	977.23	1.00	301	81.00	220	382
<i>Megalops atlanticus</i>	2	0.0	0.5	0.01	0.01	1,385.64	2.00	.	.	.	.
<i>Cynoscion</i> spp.	2	0.0	0.5	0.01	0.01	1,385.64	2.00	148	17.50	130	165
<i>Centropomus undecimalis</i>	1	0.0	0.5	0.01	0.01	1,385.64	1.00	723	.	723	723
Totals	8,856	27.9	95.3	46.13	6.74	202.54	1,034.00	.	.	11	947

Table CK07-06. Catch statistics for 10 dominant taxa collected in 120 bay 6.1-m otter trawl samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	8,744	44.9	20.0	5.09	2.99	642.62	351.99	40	0.10	19	67
<i>Anchoa hepsetus</i>	2,969	15.2	13.3	1.75	1.46	917.28	174.61	35	0.16	29	113
<i>Ariopsis felis</i>	1,225	6.3	13.3	0.71	0.43	656.21	42.68	85	1.26	60	399
<i>Orthopristis chrysoptera</i>	1,118	5.7	31.7	0.66	0.28	471.35	29.38	104	0.98	15	178
<i>Lagodon rhomboides</i>	642	3.3	36.7	0.37	0.10	298.16	7.42	92	1.10	12	135
<i>Bairdiella chrysoura</i>	624	3.2	18.3	0.37	0.14	433.84	14.50	101	1.17	10	163
<i>Leiostomus xanthurus</i>	570	2.9	13.3	0.34	0.26	835.63	30.18	24	1.24	14	165
<i>Cynoscion arenarius</i>	426	2.2	12.5	0.24	0.19	860.28	22.60	72	1.59	9	234
<i>Etropus crossotus</i>	376	1.9	55.8	0.22	0.05	246.33	3.91	82	1.01	32	128
<i>Prionotus scitulus</i>	285	1.5	66.7	0.17	0.02	165.02	1.89	91	1.87	17	165
Subtotal	16,979	87.1	.	.	.	.	.	.	.	9	399
Totals	19,483	100.0	.	11.36	4.54	437.57	528.30	.	.	2	833

Table CK07-07. Catch statistics for Selected Taxa collected in 120 bay 6.1-m otter trawl samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	570	2.9	13.3	0.34	0.26	835.63	30.18	24	1.24	14	165
<i>Cynoscion arenarius</i>	426	2.2	12.5	0.24	0.19	860.28	22.60	72	1.59	9	234
<i>Menippe</i> spp.	243	1.2	41.7	0.14	0.04	315.76	4.20	16	0.82	2	70
<i>Menticirrhus americanus</i>	206	1.1	17.5	0.12	0.06	516.10	4.76	63	3.47	9	265
<i>Callinectes sapidus</i>	192	1.0	20.8	0.11	0.05	452.69	4.86	56	2.69	11	170
<i>Farfantepenaeus duorarum</i>	75	0.4	21.7	0.04	0.01	357.19	1.15	20	0.78	4	34
<i>Paralichthys albigutta</i>	70	0.4	31.7	0.04	0.01	194.61	0.52	142	6.57	40	256
<i>Lutjanus synagris</i>	6	0.0	5.0	0.00	0.00	438.08	0.07	48	12.19	21	93
<i>Pogonias cromis</i>	3	0.0	1.7	0.00	0.00	819.52	0.14	144	13.54	125	170
<i>Mycteroperca microlepis</i>	2	0.0	1.7	0.00	0.00	771.34	0.07	138	37.50	100	175
<i>Menticirrhus saxatilis</i>	2	0.0	1.7	0.00	0.00	771.34	0.07	66	1.00	65	67
<i>Micropogonias undulatus</i>	1	0.0	0.8	0.00	0.00	1,095.45	0.07	103	.	103	103
<i>Scomberomorus maculatus</i>	1	0.0	0.8	0.00	0.00	1,095.45	0.07	20	.	20	20
Totals	1,797	9.2	75.0	1.04	0.35	371.88	30.18	.	.	2	265

Table CK07-08. Catch statistics for 10 dominant taxa collected in 108 21.3-m river seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	56,644	84.2	75.0	771.30	436.59	588.26	46,438.24	25	0.03	15	68
<i>Leiostomus xanthurus</i>	3,017	4.5	51.9	41.08	14.04	355.23	1,133.82	26	0.25	10	185
<i>Menidia</i> spp.	2,086	3.1	73.1	28.40	5.17	189.27	375.00	46	0.27	19	85
<i>Lagodon rhomboides</i>	1,276	1.9	68.5	17.37	5.31	317.86	439.71	33	0.56	10	155
<i>Eucinostomus</i> spp.	939	1.4	41.7	12.79	2.87	232.93	186.76	27	0.22	11	39
<i>Harengula jaguana</i>	383	0.6	7.4	5.22	4.10	817.21	438.24	35	0.81	21	75
<i>Bairdiella chrysoura</i>	370	0.6	16.7	5.04	3.40	700.34	358.82	26	1.20	11	110
<i>Fundulus grandis</i>	304	0.5	30.6	4.14	1.22	307.08	107.35	53	0.94	16	110
<i>Callinectes sapidus</i>	237	0.4	38.0	3.23	0.79	255.47	55.88	16	1.06	4	156
<i>Eucinostomus harengulus</i>	230	0.3	35.2	3.13	0.70	230.67	38.24	56	0.81	35	101
Subtotal	65,486	97.5	.	.	.	.	.	.	.	4	185
Totals	67,257	100.0	.	915.81	437.30	496.24	46,516.18	.	.	3	510

Table CK07-09. Catch statistics for Selected Taxa collected in 108 21.3-m river seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	3,017	4.5	51.9	41.08	14.04	355.23	1,133.82	26	0.25	10	185
<i>Callinectes sapidus</i>	237	0.4	38.0	3.23	0.79	255.47	55.88	16	1.06	4	156
<i>Mugil cephalus</i>	220	0.3	25.0	3.00	1.24	430.79	98.53	36	2.55	18	320
<i>Farfantepenaeus duorarum</i>	155	0.2	33.3	2.11	0.54	266.61	44.12	8	0.24	3	17
<i>Cynoscion arenarius</i>	130	0.2	21.3	1.77	0.62	363.95	47.06	35	1.31	10	82
<i>Sciaenops ocellatus</i>	68	0.1	21.3	0.93	0.37	415.18	35.29	51	8.65	13	451
<i>Cynoscion nebulosus</i>	60	0.1	19.4	0.82	0.22	274.40	16.18	59	3.92	17	128
<i>Menticirrhus americanus</i>	28	0.0	8.3	0.38	0.20	541.31	19.12	51	3.74	20	118
<i>Lutjanus griseus</i>	23	0.0	8.3	0.31	0.12	411.32	10.29	70	12.30	15	170
<i>Mugil curema</i>	14	0.0	2.8	0.19	0.15	831.07	16.18	45	8.90	29	134
<i>Pogonias cromis</i>	12	0.0	1.9	0.16	0.15	955.75	16.18	70	6.27	48	128
<i>Archosargus probatocephalus</i>	5	0.0	4.6	0.07	0.03	455.99	1.47	139	71.07	23	408
<i>Paralichthys albigutta</i>	4	0.0	3.7	0.05	0.03	512.28	1.47	65	14.47	37	100
<i>Scomberomorus maculatus</i>	2	0.0	0.9	0.03	0.03	1,039.23	2.94	23	3.00	20	26
<i>Elops saurus</i>	1	0.0	0.9	0.01	0.01	1,039.23	1.47	268	.	268	268
<i>Pomatomus saltatrix</i>	1	0.0	0.9	0.01	0.01	1,039.23	1.47	46	.	46	46
<i>Trachinotus falcatus</i>	1	0.0	0.9	0.01	0.01	1,039.23	1.47	21	.	21	21
<i>Cynoscion sp.</i>	1	0.0	0.9	0.01	0.01	1,039.23	1.47	44	.	44	44
Totals	3,979	5.9	96.3	54.18	14.67	281.37	1,148.53	.	.	3	451

Table CK07-10. Catch statistics for 10 dominant taxa collected in 60 21.3-m river seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	3,792	30.1	31.7	92.94	53.19	443.29	2,922.06	22	0.12	10	156
<i>Anchoa mitchilli</i>	3,226	25.6	35.0	79.07	32.86	321.90	1,630.88	31	0.14	17	55
<i>Menidia</i> spp.	1,860	14.7	66.7	45.59	14.66	249.10	701.47	39	0.42	14	93
<i>Lagodon rhomboides</i>	647	5.1	63.3	15.86	4.62	225.69	214.71	38	0.63	11	136
<i>Eucinostomus</i> spp.	488	3.9	55.0	11.96	3.87	250.37	207.35	29	0.37	9	40
<i>Gambusia holbrooki</i>	444	3.5	21.7	10.88	5.74	408.28	297.06	22	0.26	14	40
<i>Callinectes sapidus</i>	253	2.0	48.3	6.20	1.81	225.58	94.12	20	0.90	4	80
<i>Eucinostomus harengulus</i>	226	1.8	56.7	5.54	1.67	233.47	75.00	56	0.83	37	98
<i>Fundulus seminolis</i>	221	1.8	31.7	5.42	2.35	336.45	125.00	64	1.07	17	95
<i>Harengula jaguana</i>	149	1.2	6.7	3.65	2.62	556.22	151.47	41	0.97	15	72
Subtotal	11,306	89.7	.	.	.	.	.	.	.	4	156
Totals	12,616	100.0	.	309.22	72.76	182.27	3,795.59	.	.	4	400

Table CK07-11. Catch statistics for Selected Taxa collected in 60 21.3-m river seine samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	3,792	30.1	31.7	92.94	53.19	443.29	2,922.06	22	0.12	10	156
<i>Callinectes sapidus</i>	253	2.0	48.3	6.20	1.81	225.58	94.12	20	0.90	4	80
<i>Farfantepenaeus duorarum</i>	79	0.6	21.7	1.94	0.66	265.13	27.94	7	0.28	4	19
<i>Pomatomus saltatrix</i>	78	0.6	3.3	1.91	1.89	764.56	113.24	49	0.55	42	66
<i>Cynoscion arenarius</i>	60	0.5	13.3	1.47	0.84	442.64	47.06	33	1.80	14	69
<i>Sciaenops ocellatus</i>	57	0.5	13.3	1.40	0.99	549.68	58.82	31	5.49	11	325
<i>Cynoscion nebulosus</i>	24	0.2	15.0	0.59	0.33	434.72	19.12	53	4.71	23	116
<i>Lutjanus griseus</i>	15	0.1	8.3	0.37	0.25	529.15	14.71	130	15.28	28	189
<i>Menticirrhus americanus</i>	11	0.1	3.3	0.27	0.21	598.29	11.76	46	3.41	32	60
<i>Archosargus probatocephalus</i>	4	0.0	6.7	0.10	0.05	377.32	1.47	129	64.94	36	312
<i>Trachinotus falcatus</i>	2	0.0	1.7	0.05	0.05	774.60	2.94	19	1.50	17	20
<i>Pogonias cromis</i>	2	0.0	1.7	0.05	0.05	774.60	2.94	159	5.00	154	164
<i>Elops saurus</i>	1	0.0	1.7	0.02	0.02	774.60	1.47	36	.	36	36
<i>Mugil cephalus</i>	1	0.0	1.7	0.02	0.02	774.60	1.47	23	.	23	23
<i>Paralichthys albigutta</i>	1	0.0	1.7	0.02	0.02	774.60	1.47	135	.	135	135
Totals	4,380	34.7	78.3	107.35	53.49	385.94	2,947.06	.	.	4	325

Table CK07-12. Catch statistics for 10 dominant taxa collected in 60 river 6.1-m otter trawl samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	12,505	78.4	51.7	26.07	19.79	587.98	1,183.09	31	0.05	14	60
<i>Bairdiella chrysoura</i>	507	3.2	23.3	1.22	0.61	383.07	28.63	118	1.74	16	175
<i>Callinectes sapidus</i>	480	3.0	78.3	1.18	0.29	188.08	14.62	77	2.37	5	186
<i>Farfantepenaeus duorarum</i>	455	2.9	38.3	1.05	0.37	271.59	12.89	8	0.12	4	22
<i>Leiostomus xanthurus</i>	419	2.6	33.3	0.93	0.38	312.89	19.02	27	1.16	10	168
<i>Lagodon rhomboides</i>	382	2.4	41.7	0.87	0.45	401.19	25.36	25	0.63	12	104
<i>Eucinostomus</i> spp.	314	2.0	33.3	0.73	0.33	355.56	14.24	21	0.43	9	39
<i>Cynoscion arenarius</i>	260	1.6	35.0	0.59	0.18	239.64	7.02	36	1.18	13	247
<i>Symphurus plagiusa</i>	146	0.9	23.3	0.34	0.14	314.95	5.40	46	1.14	22	80
<i>Ariopsis felis</i>	53	0.3	15.0	0.12	0.08	489.32	4.59	238	6.78	71	350
Subtotal	15,521	97.3	.	.	.	.	.	.	.	4	350
Totals	15,949	100.0	.	34.08	19.75	448.92	1,185.91	.	.	4	1155

Table CK07-13. Catch statistics for Selected Taxa collected in 60 river 6.1-m otter trawl samples during Cedar Key stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Callinectes sapidus</i>	480	3.0	78.3	1.18	0.29	188.08	14.62	77	2.37	5	186
<i>Farfantepenaeus duorarum</i>	455	2.9	38.3	1.05	0.37	271.59	12.89	8	0.12	4	22
<i>Leiostomus xanthurus</i>	419	2.6	33.3	0.93	0.38	312.89	19.02	27	1.16	10	168
<i>Cynoscion arenarius</i>	260	1.6	35.0	0.59	0.18	239.64	7.02	36	1.18	13	247
<i>Menticirrhus americanus</i>	46	0.3	15.0	0.10	0.06	469.24	3.64	42	6.55	16	310
<i>Sciaenops ocellatus</i>	48	0.3	11.7	0.10	0.06	481.84	3.68	45	13.84	12	571
<i>Paralichthys albigutta</i>	22	0.1	16.7	0.05	0.02	285.05	0.67	93	10.98	34	216
<i>Lutjanus griseus</i>	24	0.2	20.0	0.05	0.02	229.42	0.54	86	11.65	14	185
<i>Micropogonias undulatus</i>	21	0.1	5.0	0.05	0.03	517.62	1.75	37	2.70	16	59
<i>Cynoscion nebulosus</i>	15	0.1	13.3	0.03	0.01	301.53	0.54	94	16.93	13	185
<i>Archosargus probatocephalus</i>	13	0.1	8.3	0.03	0.02	461.03	0.94	165	14.63	38	224
<i>Pomatomus saltatrix</i>	2	0.0	1.7	0.00	0.00	774.60	0.27	48	2.00	46	50
<i>Elops saurus</i>	1	0.0	1.7	0.00	0.00	774.60	0.15	340	.	340	340
<i>Menticirrhus saxatilis</i>	1	0.0	1.7	0.00	0.00	774.60	0.13	20	.	20	20
<i>Pogonias cromis</i>	1	0.0	1.7	0.00	0.00	774.60	0.13	151	.	151	151
Totals	1,808	11.3	95.0	4.19	0.70	129.02	20.37	.	.	4	571

Appendix CK07-01. Monthly summary of species collected during Cedar Key stratified-random sampling, 2007. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
<i>Acanthostracion quadricornis</i>	4	2	2	2	1	2	3	3	2	7	1	2	31
<i>Achirus lineatus</i>	.	.	.	.	1	.	7	8	3	7	.	1	27
<i>Adinia xenica</i>	4	1	3	8	1	.	6	1	.	90	.	5	119
<i>Aetobatus narinari</i>	.	.	.	.	.	.	.	.	1	1	.	.	2
<i>Alosa alabamae</i>	1	.	.	.	.	.	.	.	.	.	.	.	1
<i>Aluterus schoepfii</i>	.	.	1	.	2	.	4	.	.	.	.	.	7
<i>Ameiurus catus</i>	.	.	.	.	.	.	.	1	.	.	8	.	9
<i>Anchoa hepsetus</i>	14	1	1	3	288	414	60	53	125	61	2,460	12	3,492
<i>Anchoa mitchilli</i>	653	746	1,727	342	2,627	3,711	12,340	62,237	8,595	13,188	10,620	1,203	117,989
<i>Ancylosetta quadrocellata</i>	.	3	4	13	3	2	2	3	1	1	.	2	34
<i>Archosargus probatocephalus</i>	.	.	34	7	28	23	34	15	8	7	29	2	187
<i>Ariopsis felis</i>	.	.	26	26	133	158	89	915	1,065	579	15	9	3,015
<i>Astroscopus y-graecum</i>	1	.	3	.	.	.	.	.	.	.	.	.	4
<i>Bagre marinus</i>	.	.	.	.	10	12	83	37	171	51	.	.	364
<i>Bairdiella chrysoura</i>	114	154	393	87	489	876	495	282	905	4,426	9	477	8,707
<i>Bathygobius soporator</i>	.	.	.	.	.	.	1	14	1	1	2	1	20
<i>Brevoortia</i> spp.	38	35	9	30	176	33	27	138	314	17	34	2	853
<i>Calamus arctifrons</i>	.	.	.	.	.	1	7	1	3	.	1	.	13
<i>Callinectes sapidus</i>	223	217	251	440	227	72	132	80	90	94	174	89	2,089
<i>Callinectes similis</i>	.	.	.	.	9	103	.	.	.	.	.	.	112
<i>Caranx hippos</i>	.	.	.	.	.	7	.	.	6	1	1	.	15
<i>Carcharhinus limbatus</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Centropomus undecimalis</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Centropristis striata</i>	3	.	.	.	11	6	13	14	14	6	1	5	73

Appendix CK07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
<i>Chaetodipterus faber</i>	.	.	.	2	25	3	6	17	52	46	1	1	153
<i>Chasmodes saburrae</i>	1	3	1	1	.	3	15	.	.	.	1	.	25
<i>Chilomycterus schoepfii</i>	3	3	1	2	1	7	11	3	5	10	4	8	58
<i>Chloroscombrus chrysurus</i>	.	.	.	.	2	.	9	180	122	45	1	2	361
<i>Citharichthys macrops</i>	6	14	10	7	4	10	8	5	9	1	.	.	74
<i>Ctenogobius boleosoma</i>	.	2	9	5	5	1	2	.	.	2	5	1	32
<i>Cynoscion arenarius</i>	.	.	.	3	30	67	59	110	676	187	13	4	1,149
<i>Cynoscion nebulosus</i>	5	32	12	6	17	9	15	69	58	44	27	5	299
<i>Cynoscion spp.</i>	.	.	.	.	.	.	.	.	.	1	2	.	3
<i>Cyprinodon variegatus</i>	3	4	.	4	.	.	.	.	.	.	.	.	11
<i>Dasyatis americana</i>	.	.	.	.	.	2	.	.	.	.	.	.	2
<i>Dasyatis sabina</i>	24	58	302	76	360	206	147	125	175	115	92	86	1,766
<i>Dasyatis say</i>	.	.	.	.	7	4	11	5	20	19	.	.	66
<i>Deirochelys reticularia</i>	.	.	.	.	.	.	.	.	.	.	2	.	2
<i>Diplectrum sp.</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Diplectrum formosum</i>	.	.	.	.	1	1	2	1	2	3	.	.	10
<i>Diplodus holbrookii</i>	10	.	.	.	21	17	45	2	2	.	1	.	98
<i>Dorosoma cepedianum</i>	.	.	.	.	.	.	3	1	1	.	.	.	5
<i>Dorosoma petenense</i>	.	.	.	12	7	.	22	.	.	3	.	.	44
<i>Echeneis naucrates</i>	.	.	.	1	.	.	.	.	1	.	.	.	2
<i>Echeneis neucratoides</i>	1	.	.	.	1	.	.	2	4	21	4	.	33
<i>Elops saurus</i>	.	1	5	112	113	115	28	83	94	114	50	26	741
<i>Equetus lanceolatus</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Etropus crossotus</i>	28	8	24	24	1	4	30	62	146	108	40	58	533
<i>Etropus cyclosquamus</i>	.	.	.	2	.	.	3	.	.	.	.	.	5

Appendix CK07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
<i>Etropus rimosus</i>	.	.	.	.	.	.	1	.	.	.	1	.	2
<i>Eucinostomus gula</i>	61	13	1	.	4	1	.	90	40	139	77	53	479
<i>Eucinostomus harengulus</i>	101	27	33	8	20	30	11	114	69	117	102	23	655
<i>Eucinostomus spp.</i>	315	30	23	3	1	9	251	345	267	611	878	49	2,782
<i>Farfantepenaeus duorarum</i>	25	5	5	19	14	8	218	272	373	159	107	30	1,235
<i>Floridichthys carpio</i>	.	.	.	.	.	.	.	17	.	.	2	.	19
<i>Fundulus confluentus</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Fundulus grandis</i>	66	23	3	8	24	11	19	52	.	145	41	38	430
<i>Fundulus seminolis</i>	40	86	7	3	21	6	32	10	.	16	.	4	225
<i>Fundulus similis</i>	27	45	127	22	25	14	37	23	1	24	56	35	436
<i>Gambusia holbrooki</i>	39	.	31	.	204	.	.	10	.	101	79	22	486
<i>Gobiesox strumosus</i>	.	.	.	.	1	.	1	1	.	.	.	4	7
<i>Gobiosoma bosc</i>	104	.	5	2	3	2	27	43	3	10	4	4	207
<i>Gobiosoma longipala</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Gobiosoma robustum</i>	.	.	.	.	2	1	4	.	.	.	.	.	7
<i>Gobiosoma spp.</i>	35	2	5	.	.	6	12	22	2	5	8	2	99
<i>Gymnura micrura</i>	.	.	.	.	5	.	11	3	19	3	.	.	41
<i>Haemulon aurolineatum</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Haemulon plumierii</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Halichoeres bivittatus</i>	.	.	.	.	.	1	2	.	5	2	.	.	10
<i>Harengula jaguana</i>	.	.	.	6	2	74	511	21	812	328	33	69	1,856
<i>Hemicaranx amblyrhynchus</i>	.	.	.	.	.	.	.	5	.	1	.	.	6
<i>Hippocampus erectus</i>	2	.	2	1	1	2	2	.	.	.	1	2	13
<i>Hypleurochilus caudovittatus</i>	.	.	.	1	.	2	.	.	.	.	.	.	3
<i>Hyporhamphus meeki</i>	1	.	.	.	.	5	13	.	4	.	.	2	25

Appendix CK07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66		E=792
<i>Hypsoblennius hentz</i>	.	1	.	.	1	.	.	.	.	2	.	1	5
<i>Labidesthes sicculus</i>	.	.	.	.	.	.	.	.	.	.	.	1	1
<i>Lactophrys trigonus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Lagodon rhomboides</i>	732	1,234	1,839	1,734	2,544	1,483	2,629	1,449	1,567	1,753	902	740	18,606
<i>Leiostomus xanthurus</i>	7,269	3,783	582	1,837	1,160	293	358	259	193	134	5	168	16,041
<i>Lepidochelys kempii</i>	1	.	.	.	.	.	.	.	.	.	.	.	1
<i>Lepisosteus osseus</i>	1	3	.	.	1	2	1	10	21	3	1	.	43
<i>Lepisosteus platyrhincus</i>	.	.	.	.	.	.	.	1	1	2	.	.	4
<i>Lepomis auritus</i>	.	.	.	1	.	.	.	1	.	1	3	5	11
<i>Lepomis macrochirus</i>	.	1	1	.	5	.	1	7	.	13	2	5	35
<i>Lepomis microlophus</i>	.	.	5	1	1	1	.	1	.	.	2	3	14
<i>Lepomis punctatus</i>	.	.	.	.	9	12	.	1	.	27	4	5	58
<i>Lepomis spp.</i>	.	.	.	.	.	.	.	.	.	22	.	.	22
<i>Limulus polyphemus</i>	.	.	.	.	7	4	1	3	.	1	.	.	16
<i>Lobotes surinamensis</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Lucania goodei</i>	3	.	1	.	.	.	.	.	.	2	.	.	6
<i>Lucania parva</i>	16	6	23	1	13	3	2	1	.	.	.	.	65
<i>Lutjanus griseus</i>	1	.	.	4	1	1	9	3	13	29	15	10	86
<i>Lutjanus synagris</i>	.	.	.	.	.	.	.	1	1	4	1	.	7
<i>Malaclemys terrapin</i>	.	.	1	.	3	4	1	.	.	.	.	.	9
<i>Megalops atlanticus</i>	.	.	.	.	.	.	.	.	.	.	2	.	2
<i>Membras martinica</i>	2	3	.	7	123	401	1,024	517	122	157	3	204	2,563
<i>Menidia spp.</i>	691	347	283	110	335	700	665	533	132	691	821	218	5,526
<i>Menippe spp.</i>	7	59	13	3	11	21	7	16	19	52	16	21	245
<i>Menticirrhus americanus</i>	2	.	7	2	30	46	50	83	264	151	16	24	675

Appendix CK07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
<i>Menticirrhus saxatilis</i>	.	.	.	6	12	6	1	.	.	.	1	.	26
<i>Microgobius gulosus</i>	1	.	6	1	3	3	19	11	17	7	18	7	93
<i>Microgobius thalassinus</i>	.	.	4	1	.	.	4	10	12	8	3	.	42
<i>Micropogonias undulatus</i>	.	.	13	4	5	.	.	9	8	.	.	.	39
<i>Micropterus salmoides</i>	1	1	5	1	38	6	5	14	.	5	2	2	80
<i>Mugil cephalus</i>	126	782	158	169	189	552	112	32	63	232	111	216	2,742
<i>Mugil curema</i>	1	.	11	37	46	16	2	6	12	84	114	66	395
<i>Mugil gyrans</i>	.	.	.	.	4	.	.	.	.	9	43	5	61
<i>Mycteroperca microlepis</i>	.	.	.	.	.	.	3	3	3	2	.	.	11
<i>Myrophis punctatus</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Nicholsina usta</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Notropis petersoni</i>	.	.	.	.	1	1	.	.	.	5	.	.	7
<i>Ogcocephalus cubifrons</i>	9	3	13	22	20	13	20	37	10	59	8	27	241
<i>Oligoplites saurus</i>	.	.	.	.	6	2	23	34	26	28	5	20	144
<i>Ophichthidae sp.</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Ophichthus gomesii</i>	.	.	.	.	.	.	.	.	1	2	.	.	3
<i>Opisthonema oglinum</i>	.	.	3	21	27	52	36	95	226	31	.	1	492
<i>Opsanus beta</i>	.	.	.	1	2	7	7	5	.	1	1	.	24
<i>Orthopristis chrysoptera</i>	.	.	.	120	973	250	858	301	295	381	52	24	3,254
<i>Parablennius marmoreus</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Paralichthys albigutta</i>	14	14	67	46	70	23	39	23	37	22	10	8	373
<i>Paralichthys lethostigma</i>	.	.	2	1	.	.	.	.	.	.	.	.	3
<i>Peprilus burti</i>	.	.	.	1	.	1	.	.	.	.	.	.	2
<i>Peprilus paru</i>	.	.	.	.	.	3	.	.	3	8	.	.	14
<i>Poecilia latipinna</i>	.	.	.	.	1	.	1	3	.	5	1	.	11

Appendix CK07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
<i>Pogonias cromis</i>	1	.	1	1	7	1	28	121	103	52	32	10	357
<i>Pomatomus saltatrix</i>	.	1	2	5	3	86	2	1	.	.	1	1	102
<i>Portunus</i> spp.	3	1	6	6	52	23	18	52	30	12	5	23	231
<i>Prionotus scitulus</i>	18	24	18	8	9	15	36	12	34	103	42	10	329
<i>Prionotus tribulus</i>	10	6	14	10	3	1	3	5	.	12	8	18	90
<i>Rhinoptera bonasus</i>	.	.	15	4	27	38	3	5	129	7	15	6	249
<i>Rhizoprionodon terraenovae</i>	.	.	.	.	.	1	5	.	.	.	.	.	6
<i>Rimapenaeus constrictus</i>	.	5	.	.	.	6	.	.	.	.	.	.	11
<i>Sciaenops ocellatus</i>	54	11	43	38	26	41	24	18	33	58	173	54	573
<i>Scomberomorus maculatus</i>	.	.	.	2	17	1	3	6	3	5	1	.	38
<i>Scorpaena brasiliensis</i>	.	.	.	.	.	.	7	1	.	.	.	.	8
<i>Selene vomer</i>	.	.	.	.	1	2	1	3	8	1	.	.	16
<i>Serraniculus pumilio</i>	2	1	.	1	.	.	.	.	1	.	5	.	10
<i>Serranus subligarius</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Sicyonia laevigata</i>	.	.	.	1	1	.	.	.	.	.	.	.	2
<i>Sphoeroides nephelus</i>	2	3	4	6	25	22	11	2	3	1	7	2	88
<i>Sphyrna tiburo</i>	.	.	.	.	2	2	.	.	14	1	1	.	20
<i>Stephanolepis hispidus</i>	3	2	.	2	3	13	16	8	7	3	10	1	68
<i>Strongylura marina</i>	17	3	15	7	2	2	42	18	2	.	10	12	130
<i>Strongylura notata</i>	.	.	25	.	.	.	.	9	1	2	29	.	66
<i>Strongylura</i> spp.	.	.	.	.	6	5	2	1	1	.	.	.	15
<i>Strongylura timucu</i>	.	.	1	.	.	9	5	14	.	1	.	.	30
<i>Symphurus plagiusa</i>	2	5	8	32	26	7	22	52	128	35	8	6	331
<i>Syngnathus floridae</i>	2	1	2	2	3	20	14	6	1	9	.	.	60
<i>Syngnathus louisianae</i>	2	1	1	3	.	2	7	3	6	5	1	2	33

Appendix CK07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
<i>Syngnathus scovelli</i>	6	8	5	2	13	17	55	23	.	6	1	2	138
<i>Synodus foetens</i>	6	3	2	8	15	16	29	5	11	17	11	6	129
<i>Trachinotus falcatus</i>	.	3	.	.	.	.	.	3	4	.	1	.	11
<i>Trinectes maculatus</i>	3	2	23	8	6	.	2	15	37	2	9	17	124
<i>Urophycis floridana</i>	3	3	3	2	.	.	.	.	.	.	.	.	11
<i>Urophycis regia</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
Totals	10,963	7,837	6,287	5,569	10,816	10,279	21,086	69,348	17,869	25,186	17,519	4,289	207,048

Appendix CK07-02. Summary by gear, stratum, and zone of species collected during Cedar Key stratified-random sampling, 2007. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine, 183-m haul seine, and 6.1-m otter trawl were not stratified. Zone B encompassed the northern portion of the universe and included all tidal creeks; Zone C encompassed the southern portion of the universe; and Zone F encompassed the lower Suwannee River. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	B	C	F	
	Veg	Unveg	Shore							
	E=31	E=113	E=108	E=168	E=192	E=180	E=384	E=288	E=120		E=792
<i>Acanthostracion quadricornis</i>	.	1	.	.	.	30	13	18	.	31
<i>Achirus lineatus</i>	.	5	5	9	.	8	12	9	6	27
<i>Adinia xenica</i>	.	.	2	117	.	.	117	.	2	119
<i>Aetobatus narinari</i>	.	.	.	.	2	.	1	1	.	2
<i>Alosa alabamae</i>	.	.	.	.	1	.	1	.	.	1
<i>Aluterus schoepfii</i>	.	.	.	.	.	7	2	5	.	7
<i>Ameiurus catus</i>	.	.	.	1	.	8	.	.	9	9
<i>Anchoa hepsetus</i>	32	313	53	121	.	2,973	2,887	531	74	3,492
<i>Anchoa mitchilli</i>	693	9,962	26,215	59,870	.	21,249	98,233	4,025	15,731	117,989
<i>Ancylopsetta quadrocellata</i>	.	.	.	.	12	22	17	17	.	34
<i>Archosargus probatocephalus</i>	5	.	4	9	156	13	141	29	17	187
<i>Ariopsis felis</i>	1	1,161	99	1	475	1,278	305	2,657	53	3,015
<i>Astroscopus y-graecum</i>	.	.	2	.	2	.	.	4	.	4
<i>Bagre marinus</i>	.	47	1	.	302	14	64	299	1	364
<i>Bairdiella chrysoura</i>	603	54	43	437	6,439	1,131	5,036	3,097	574	8,707
<i>Bathygobius soporator</i>	.	.	.	17	.	3	14	.	6	20
<i>Brevoortia</i> spp.	.	30	72	181	563	7	458	382	13	853
<i>Calamus arctifrons</i>	1	.	.	.	.	12	8	5	.	13
<i>Callinectes sapidus</i>	9	198	401	490	319	672	945	411	733	2,089
<i>Callinectes similis</i>	.	.	.	.	.	112	110	2	.	112
<i>Caranx hippos</i>	.	.	1	.	14	.	15	.	.	15
<i>Carcharhinus limbatus</i>	.	.	.	.	1	.	.	1	.	1
<i>Centropomus undecimalis</i>	.	.	.	.	1	.	.	1	.	1
<i>Centropristis striata</i>	21	1	.	.	1	50	14	59	.	73
<i>Chaetodipterus faber</i>	.	4	.	.	85	64	47	105	1	153
<i>Chasmodes saburrae</i>	17	.	3	.	3	2	2	22	1	25

Appendix CK07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	B	C	F	
	Veg	Unveg	Shore							
	E=31	E=113	E=108	E=168	E=192	E=180	E=384	E=288	E=120		E=792
<i>Chilomycterus schoepfii</i>	2	.	3	1	9	43	32	24	2	58
<i>Chloroscombrus chrysurus</i>	7	42	39	29	27	217	256	84	21	361
<i>Citharichthys macrops</i>	.	1	.	.	.	73	27	47	.	74
<i>Ctenogobius boleosoma</i>	1	3	16	11	.	1	21	9	2	32
<i>Cynoscion arenarius</i>	.	80	127	190	66	686	376	453	320	1,149
<i>Cynoscion nebulosus</i>	15	6	29	84	150	15	150	110	39	299
<i>Cynoscion</i> spp.	.	.	.	1	2	.	3	.	.	3
<i>Cyprinodon variegatus</i>	.	.	.	4	7	.	6	5	.	11
<i>Dasyatis americana</i>	.	.	.	1	.	1	.	1	1	2
<i>Dasyatis sabina</i>	5	28	18	7	1,548	160	1,129	611	26	1,766
<i>Dasyatis say</i>	.	2	.	.	49	15	30	36	.	66
<i>Deirochelys reticularia</i>	.	.	.	.	.	2	.	.	2	2
<i>Diplectrum</i> sp.	.	.	.	.	.	1	.	1	.	1
<i>Diplectrum formosum</i>	.	.	.	.	.	10	4	6	.	10
<i>Diplodus holbrookii</i>	40	.	.	.	46	12	.	98	.	98
<i>Dorosoma cepedianum</i>	.	.	.	.	5	.	1	4	.	5
<i>Dorosoma petenense</i>	.	.	.	3	41	.	7	37	.	44
<i>Echeneis naucrates</i>	.	.	.	.	2	.	1	1	.	2
<i>Echeneis neucratoides</i>	.	.	.	.	33	.	5	28	.	33
<i>Elops saurus</i>	.	4	.	2	734	1	469	270	2	741
<i>Equetus lanceolatus</i>	.	.	.	.	.	1	.	1	.	1
<i>Etropus crossotus</i>	.	11	18	.	117	387	235	287	11	533
<i>Etropus cyclosquamus</i>	.	2	.	.	.	3	.	5	.	5
<i>Etropus rimosus</i>	.	.	.	.	.	2	1	1	.	2
<i>Eucinostomus gula</i>	5	42	79	101	124	128	145	272	62	479
<i>Eucinostomus harengulus</i>	1	45	56	456	59	38	320	77	258	655
<i>Eucinostomus</i> spp.	98	87	854	1,427	.	316	1,245	735	802	2,782
<i>Farfantepenaeus duorarum</i>	51	141	240	234	39	530	428	273	534	1,235
<i>Floridichthys carpio</i>	.	.	19	.	.	.	.	19	.	19
<i>Fundulus confluentus</i>	.	.	.	1	.	.	1	.	.	1
<i>Fundulus grandis</i>	.	3	23	395	9	.	317	22	91	430
<i>Fundulus seminolis</i>	.	.	.	225	.	.	4	.	221	225
<i>Fundulus similis</i>	.	4	134	138	160	.	169	243	24	436

Appendix CK07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	B	C	F	
	Veg	Unveg	Shore							
	E=31	E=113	E=108	E=168	E=192	E=180	E=384	E=288	E=120		E=792
<i>Gambusia holbrooki</i>	.	.	.	486	.	.	42	.	444	486
<i>Gobiesox strumosus</i>	.	2	.	.	.	5	3	.	4	7
<i>Gobiosoma bosc</i>	1	6	9	158	.	33	72	5	130	207
<i>Gobiosoma longipala</i>	.	.	.	.	.	1	.	1	.	1
<i>Gobiosoma robustum</i>	5	1	.	.	.	1	1	6	.	7
<i>Gobiosoma spp.</i>	2	11	2	75	.	9	30	4	65	99
<i>Gymnura micrura</i>	.	.	.	.	36	5	8	33	.	41
<i>Haemulon aurolineatum</i>	.	.	.	.	.	1	1	.	.	1
<i>Haemulon plumierii</i>	1	.	.	.	.	.	.	1	.	1
<i>Halichoeres bivittatus</i>	8	.	.	.	.	2	.	10	.	10
<i>Harengula jaguana</i>	786	60	50	532	416	12	736	971	149	1,856
<i>Hemicarax amblyrhynchus</i>	.	.	.	.	1	5	5	1	.	6
<i>Hippocampus erectus</i>	1	.	.	.	1	11	3	10	.	13
<i>Hypleurochilus caudovittatus</i>	.	1	.	.	.	2	2	1	.	3
<i>Hyporhamphus meeki</i>	12	4	4	.	5	.	1	24	.	25
<i>Hypsoblennius hentz</i>	2	1	.	.	.	2	1	4	.	5
<i>Labidesthes sicculus</i>	.	.	.	1	.	.	.	.	1	1
<i>Lactophrys trigonus</i>	.	.	.	.	.	1	1	.	.	1
<i>Lagodon rhomboides</i>	3,429	194	1,658	1,923	10,378	1,024	5,453	12,124	1,029	18,606
<i>Leiostomus xanthurus</i>	1	1,877	2,804	6,809	3,561	989	8,467	3,363	4,211	16,041
<i>Lepidochelys kempii</i>	.	.	.	.	.	1	1	.	.	1
<i>Lepisosteus osseus</i>	.	.	.	1	40	2	38	4	1	43
<i>Lepisosteus platyrhincus</i>	.	.	.	4	.	.	3	.	1	4
<i>Lepomis auritus</i>	.	.	.	11	.	.	.	.	11	11
<i>Lepomis macrochirus</i>	.	.	.	35	.	.	.	.	35	35
<i>Lepomis microlophus</i>	.	.	.	14	.	.	1	.	13	14
<i>Lepomis punctatus</i>	.	.	.	58	.	.	.	.	58	58
<i>Lepomis spp.</i>	.	.	.	22	.	.	.	.	22	22
<i>Limulus polyphemus</i>	.	.	.	.	16	.	11	5	.	16
<i>Lobotes surinamensis</i>	.	.	.	.	1	.	1	.	.	1
<i>Lucania goodei</i>	.	.	.	6	.	.	.	.	6	6
<i>Lucania parva</i>	.	.	.	65	.	.	12	.	53	65
<i>Lutjanus griseus</i>	.	3	4	38	17	24	32	15	39	86

Appendix CK07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	B	C	F	
	Veg	Unveg	Shore							
	E=31	E=113	E=108	E=168	E=192	E=180	E=384	E=288	E=120		E=792
<i>Lutjanus synagris</i>	.	1	.	.	.	6	3	4	.	7
<i>Malaclemys terrapin</i>	.	.	.	.	9	.	1	8	.	9
<i>Megalops atlanticus</i>	.	.	.	.	2	.	2	.	.	2
<i>Membras martinica</i>	30	397	1,890	246	.	.	1,296	1,189	78	2,563
<i>Menidia</i> spp.	34	255	1,290	3,946	1	.	3,113	553	1,860	5,526
<i>Menippe</i> spp.	.	.	.	.	2	243	103	142	.	245
<i>Menticirrhus americanus</i>	5	100	174	39	105	252	323	295	57	675
<i>Menticirrhus saxatilis</i>	.	8	15	.	.	3	16	9	1	26
<i>Microgobius gulosus</i>	2	10	7	39	.	35	37	5	51	93
<i>Microgobius thalassinus</i>	.	11	15	4	.	12	13	18	11	42
<i>Micropogonias undulatus</i>	.	.	.	.	17	22	2	16	21	39
<i>Micropterus salmoides</i>	.	.	.	79	.	1	1	.	79	80
<i>Mugil cephalus</i>	1	9	123	221	2,388	.	1,929	812	1	2,742
<i>Mugil curema</i>	1	.	7	14	373	.	183	212	.	395
<i>Mugil gyrans</i>	.	.	8	.	53	.	5	56	.	61
<i>Mycteroperca microlepis</i>	4	.	.	.	5	2	1	10	.	11
<i>Myrophis punctatus</i>	.	1	.	.	.	.	1	.	.	1
<i>Nicholsina usta</i>	.	.	.	.	.	1	.	1	.	1
<i>Notropis petersoni</i>	.	.	.	7	.	.	.	.	7	7
<i>Ogcocephalus cubifrons</i>	.	5	6	.	115	115	17	224	.	241
<i>Oligoplites saurus</i>	11	16	67	25	25	.	72	68	4	144
<i>Ophichthidae</i> sp.	.	1	.	.	.	.	1	.	.	1
<i>Ophichthus gomesii</i>	.	.	.	.	.	3	.	1	2	3
<i>Opisthonema oglinum</i>	134	36	111	17	187	7	273	208	11	492
<i>Opsanus beta</i>	8	1	1	1	7	6	3	20	1	24
<i>Orthopristis chrysoptera</i>	930	101	64	9	1,030	1,120	435	2,815	4	3,254
<i>Parablennius marmoratus</i>	.	.	.	.	.	1	.	1	.	1
<i>Paralichthys albigutta</i>	8	28	32	5	208	92	179	171	23	373
<i>Paralichthys lethostigma</i>	.	.	1	.	2	.	3	.	.	3
<i>Peprilus burti</i>	.	.	1	.	1	.	2	.	.	2
<i>Peprilus paru</i>	.	.	.	.	11	3	4	10	.	14
<i>Poecilia latipinna</i>	.	.	.	11	.	.	11	.	.	11
<i>Pogonias cromis</i>	.	1	55	14	283	4	112	242	3	357

Appendix CK07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	B	C	F	
	Veg	Unveg	Shore							
	E=31	E=113	E=108	E=168	E=192	E=180	E=384	E=288	E=120		E=792
<i>Pomatomus saltatrix</i>	.	.	2	79	19	2	9	13	80	102
<i>Portunus</i> spp.	12	15	2	.	.	202	93	138	.	231
<i>Prionotus scitululus</i>	2	19	18	1	4	285	130	199	.	329
<i>Prionotus tribulus</i>	1	13	16	1	18	41	51	36	3	90
<i>Rhinoptera bonasus</i>	.	3	.	.	243	3	204	44	1	249
<i>Rhizoprionodon terraenovae</i>	.	2	.	.	4	.	.	6	.	6
<i>Rimapenaeus constrictus</i>	.	.	5	.	.	6	6	5	.	11
<i>Sciaenops ocellatus</i>	1	18	64	125	317	48	380	88	105	573
<i>Scomberomorus maculatus</i>	.	3	.	2	32	1	32	6	.	38
<i>Scorpaena brasiliensis</i>	.	.	.	.	.	8	.	8	.	8
<i>Selene vomer</i>	.	.	.	.	13	3	6	10	.	16
<i>Serraniculus pumilio</i>	.	.	.	.	.	10	6	4	.	10
<i>Serranus subligarius</i>	.	.	.	.	.	1	1	.	.	1
<i>Sicyonia laevigata</i>	.	.	.	.	.	2	1	1	.	2
<i>Sphoeroides nephelus</i>	11	15	19	4	18	21	51	37	.	88
<i>Sphyrna tiburo</i>	1	.	.	.	19	.	4	16	.	20
<i>Stephanolepis hispidus</i>	10	1	2	.	.	55	31	37	.	68
<i>Strongylura marina</i>	35	6	3	13	73	.	65	63	2	130
<i>Strongylura notata</i>	.	.	8	7	51	.	46	20	.	66
<i>Strongylura</i> spp.	.	3	6	6	.	.	6	4	5	15
<i>Strongylura timucu</i>	2	.	10	16	2	.	11	14	5	30
<i>Symphurus plagiusa</i>	2	19	57	28	2	223	82	97	152	331
<i>Syngnathus floridae</i>	40	1	6	1	.	12	13	46	1	60
<i>Syngnathus louisianae</i>	7	1	1	.	.	24	13	20	.	33
<i>Syngnathus scovelli</i>	82	7	5	25	.	19	28	84	26	138
<i>Synodus foetens</i>	9	17	21	18	12	52	58	66	5	129
<i>Trachinotus falcatus</i>	.	.	3	3	5	.	8	1	2	11
<i>Trinectes maculatus</i>	.	1	.	66	9	48	34	37	53	124
<i>Urophycis floridana</i>	.	.	1	.	.	10	9	2	.	11
<i>Urophycis regia</i>	.	.	.	.	.	1	1	.	.	1
Totals	7,238	15,562	37,203	79,873	31,740	35,432	138,269	40,214	28,565	207,048

Intentionally Left Blank

Apalachicola Bay

Apalachicola Bay is a shallow, semi-enclosed estuary, located on the northwestern coast of Florida. The estuary is bounded by a barrier island complex (St. Vincent Island, Little St. George Island, St. George Island, and Dog Island) and connected to the Gulf of Mexico through four passes (Indian Pass, West Pass, East Pass, and Sikes Cut). East of Dog Island, St. George Sound is open to the Gulf (Figure AP07-01). Freshwater inflow to Apalachicola Bay primarily comes from the Apalachicola River and to a lesser extent the Carrabelle River (Livingston 1983). Shoreline vegetation consists largely of marsh grasses and bottom substrates are typically characterized as sand or mud with oyster beds scattered throughout the bay (Ingle and Dawson 1953). Less than 7% of the substrate is covered by seagrass (Continental Shelf Associates, Inc. 1985).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Apalachicola Bay since 1998. The area sampled was divided into two geographically-defined bay zones (A and B) and one riverine zone (C; Figure AP07-01). Monthly stratified-random sampling (SRS) was conducted in Zones A and B using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zone C with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in Apalachicola Bay.

Stratified-Random Sampling

A total of 191,495 fishes (176 taxa) and selected invertebrates (13 taxa) were collected from 839 Apalachicola Bay SRS samples in 2007 (Table AP07-01; Appendices AP07-01 and -02). *Anchoa mitchilli* (n=60,530) was the most numerous species collected, representing 31.6% of the total catch. *Lagodon rhomboides* (n=30,983), *Brevoortia* spp. (n=14,395), *Leiostomus xanthurus* (n=13,029), and *Micropogonias undulatus* (n=10,129) were the next most abundant taxa collected,

accounting for an additional 35.8% of the total catch. Thirty-one Selected Taxa (n=46,040) composed 24.0% of the total catch. *Leiostomus xanthurus* (n=13,029), *M. undulatus* (n=10,129), and *Cynoscion arenarius* (n=5,897) were the most abundant Selected Taxa, representing 15.2% of the annual catch. Collections in 2007 included three species new to the Apalachicola Bay FIM collection: *Carcharhinus brevipinna* (spinner shark), *Dactyloscopus moorei* (speckled stargazer), and *Lutjanus jocu* (dog snapper).

Bay Sampling

21.3-m Bay Seines. A total of 51,916 animals were collected in 240 21.3-m bay seines, representing 27.1% of the overall SRS catch (Table AP07-01). *Lagodon rhomboides* (n=11,423) and *A. mitchilli* (n=10,495) were the most abundant taxa, accounting for 42.2% of the 21.3-m bay seine catch (Table AP07-02). The taxon most frequently caught in 21.3-m bay seines was *L. rhomboides* (63.8% occurrence).

A total of 13,638 animals from 27 Selected Taxa were collected, representing 26.3% of the entire 21.3-m bay seine catch (Table AP07-03). *Leiostomus xanthurus* (n=5,986) and *Mugil cephalus* (n=3,190) were the most abundant Selected Taxa, accounting for 67.3% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *L. xanthurus* (39.2% occurrence), *Callinectes sapidus* (37.1% occurrence), and *Farfantepenaeus* spp. (37.1% occurrence).

183-m Haul Seines. A total of 45,091 animals were collected in 216 183-m haul seines, representing 23.5% of the overall SRS catch (Table AP07-01). *Lagodon rhomboides* (n=16,734) was the most abundant taxon, accounting for 37.1% of the 183-m haul seine catch (Table AP07-04). The taxa most frequently caught in 183-m haul seines were *L. rhomboides* (89.4% occurrence) and *M. cephalus*. (71.8% occurrence).

A total of 11,989 animals from 28 Selected Taxa were collected, representing 26.6% of the entire 183-m haul seine catch (Table AP07-05). *Leiostomus xanthurus* (n=4,322), *M. undulatus* (n=3,451), and *M. cephalus* (n=1,612) were the most abundant Selected Taxa, accounting for 78.3% of the Selected Taxa collected with this gear. The

Selected Taxon most frequently caught in 183-m haul seines was *M. cephalus* (71.8% occurrence).

6.1-m Bay Otter Trawls. A total of 20,149 animals were collected in 144 6.1-m bay otter trawls, representing 10.5% of the overall SRS catch (Table AP07-01). *Anchoa mitchilli* (n=7,687) was the most abundant taxon collected, accounting for 38.2% of the 6.1-m bay otter trawl catch (Table AP07-06). The taxon most frequently caught in 6.1-m bay otter trawls was *Etropus crossotus* (67.4% occurrence).

A total of 5,687 animals from 19 Selected Taxa were collected, representing 28.2% of the entire 6.1-m bay otter trawl catch (Table AP07-07). *Micropogonias undulatus* (n=1,940), *L. xanthurus* (n=1,372), and *C. arenarius* (n=1,111) were the most abundant Selected Taxa, accounting for 77.8% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 6.1-m bay otter trawls was *L. xanthurus* (56.3% occurrence).

River Sampling

21.3-m River Seines. A total of 17,550 animals were collected in 155 21.3-m river seines, representing 9.2% of the overall SRS catch (Table AP07-01). *Menidia spp.* (n=2,765) and *Anchoa mitchilli* (n=2,639) were the most abundant taxa collected, accounting for 30.8% of the 21.3-m river seine catch (Table AP07-08). The taxon most frequently caught in 21.3-m river seines was *C. sapidus* (63.9% occurrence).

A total of 1,422 animals from 16 Selected Taxa were collected, representing 8.1% of the entire 21.3-m river seine catch (Table AP07-09). *Callinectes sapidus* (n=653) was the most abundant Selected Taxon, accounting for 45.9% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m river seines was *C. sapidus* (63.9% occurrence).

6.1-m River Otter Trawls. A total of 56,789 animals were collected in 84 6.1-m river otter trawls, representing 29.7% of the overall SRS catch (Table AP07-01). *Anchoa mitchilli* (n=39,707) was the most abundant species collected, accounting for 69.9% of the 6.1-m river otter trawl catch (Table AP07-10). The taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (71.4% occurrence) and *A. mitchilli* (64.3% occurrence).

A total of 13,304 animals from 17 Selected Taxa were collected, representing 23.4% of the entire 6.1-m river otter trawl catch (Table AP07-11). *Micropogonias undulatus* (n=4,211) and *C. arenarius* (n=4,044) were the most abundant Selected Taxa, accounting for 62.0% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 6.1-m river otter trawls was *C. sapidus* (71.4% occurrence).

References

- Continental Shelf Associates, Inc. 1985. Apalachicola Bay study; Submersed vegetation assessment of the Apalachicola Bay system. Prepared for the U.S. Army Corps of Engineers, Mobile District, Sea Grant Publication No. MASGP 84 020.
- Ingle, R.M. and C.E. Dawson, Jr. 1953. A survey of Apalachicola Bay. Fla. State Board Conserv. Mar. Lab. Tech. Ser. No. 10. 38 p.
- Livingston, R. J. 1983. Resource Atlas of the Apalachicola Estuary. Florida Sea Grant College Program. Report 55. 64 pp.

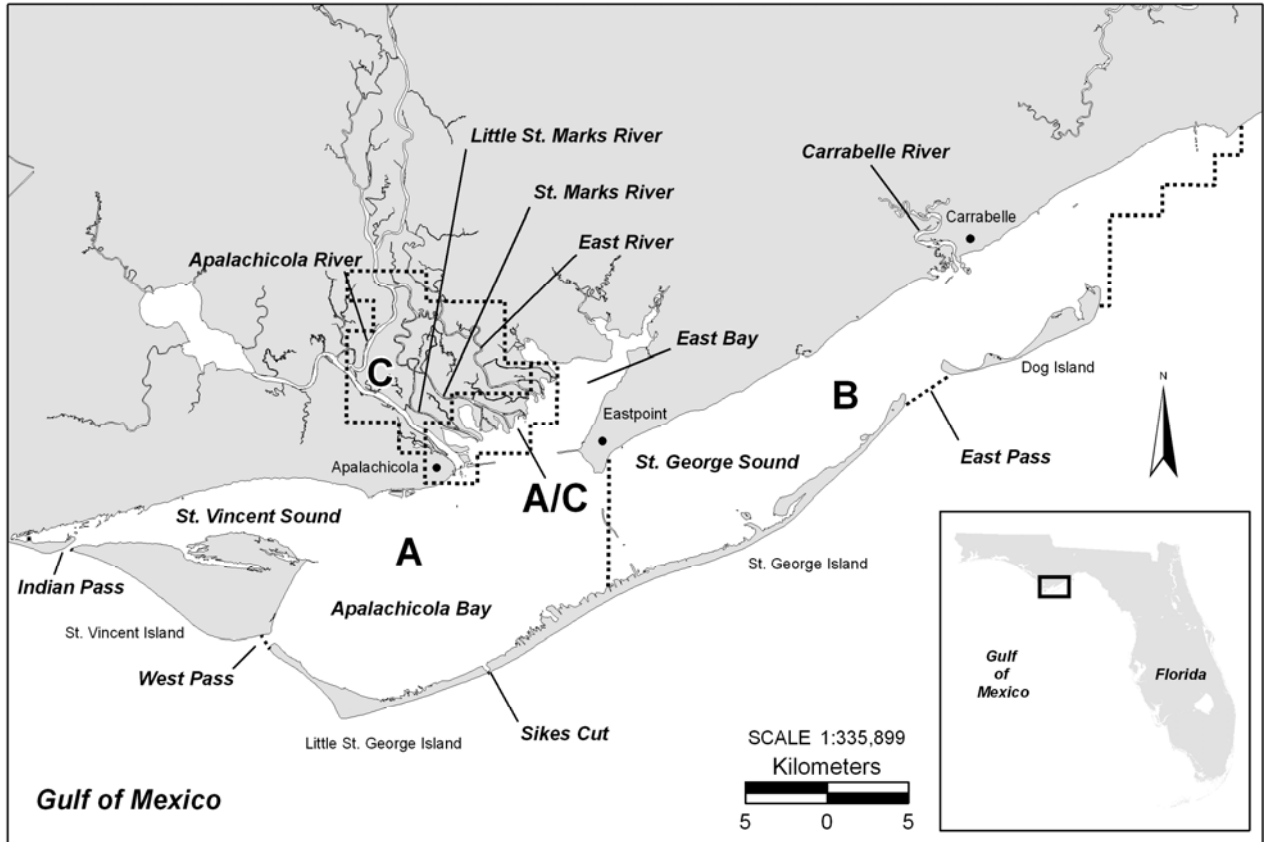


Figure AP07-01. Map of Apalachicola Bay sampling area. Zones are labeled A - C. Grids containing portions of Zone A and C are labeled A/C.

Table AP07-01. Summary of catch and effort data for Apalachicola Bay stratified-random sampling, 2007.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	37,614	121	.	.	27,984	108	13,235	72	78,833	301
B	14,302	119	.	.	17,107	108	6,914	72	38,323	299
C	.	.	17,550	155	.	.	56,789	84	74,339	239
Totals	51,916	240	17,550	155	45,091	216	76,938	228	191,495	839

Table AP07-02. Catch statistics for 10 dominant taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	11,423	22.0	63.8	34.00	10.62	483.87	1,805.71	31	0.18	12	157
<i>Anchoa mitchilli</i>	10,495	20.2	29.6	31.24	7.89	391.09	998.57	30	0.08	14	70
<i>Leiostomus xanthurus</i>	5,986	11.5	39.2	17.82	4.21	366.15	577.86	26	0.18	11	174
<i>Brevoortia</i> spp.	3,737	7.2	12.1	11.12	7.55	1,051.54	1,733.57	35	0.22	15	140
<i>Mugil cephalus</i>	3,190	6.1	16.7	9.49	4.09	668.06	802.86	27	0.21	17	183
<i>Menidia</i> spp.	2,314	4.5	27.9	6.89	1.89	424.90	321.43	49	0.33	18	104
<i>Eucinostomus</i> spp.	2,271	4.4	30.8	6.76	2.01	461.59	395.00	24	0.15	10	41
<i>Anchoa hepsetus</i>	1,369	2.6	18.3	4.07	2.44	928.53	537.14	35	0.27	25	117
<i>Orthopristis chrysoptera</i>	1,278	2.5	16.7	3.80	1.14	463.81	155.71	33	0.52	14	163
<i>Lucania parva</i>	990	1.9	3.3	2.95	2.24	1,179.89	519.29	25	0.13	18	38
Subtotal	43,053	82.9	.	.	.	.	.	.	.	10	183
Totals	51,916	100.0	.	154.51	18.00	180.48	1,893.57	.	.	2	760

Table AP07-03. Catch statistics for Selected Taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	5,986	11.5	39.2	17.82	4.21	366.15	577.86	26	0.18	11	174
<i>Mugil cephalus</i>	3,190	6.1	16.7	9.49	4.09	668.06	802.86	27	0.21	17	183
<i>Farfantepenaeus</i> spp.	897	1.7	37.1	2.67	0.52	304.45	67.86	7	0.10	2	14
<i>Mugil curema</i>	848	1.6	6.3	2.52	1.33	816.59	260.71	39	0.55	21	125
<i>Callinectes sapidus</i>	837	1.6	37.1	2.49	0.43	266.75	45.71	13	0.50	3	163
<i>Cynoscion arenarius</i>	716	1.4	11.3	2.13	1.01	732.11	224.29	25	0.35	11	76
<i>Micropogonias undulatus</i>	517	1.0	12.1	1.54	0.52	525.95	73.57	21	0.52	12	186
<i>Litopenaeus setiferus</i>	217	0.4	9.2	0.65	0.28	682.71	49.29	10	0.28	3	29
<i>Cynoscion nebulosus</i>	136	0.3	9.2	0.40	0.14	531.61	25.00	35	2.07	14	209
<i>Menticirrhus americanus</i>	134	0.3	12.1	0.40	0.12	456.88	15.71	40	2.07	12	160
<i>Sciaenops ocellatus</i>	30	0.1	5.4	0.09	0.03	553.12	5.71	54	8.99	13	274
<i>Paralichthys albigutta</i>	26	0.1	5.8	0.08	0.02	474.61	2.86	42	7.28	11	164
<i>Lutjanus griseus</i>	23	0.0	3.3	0.07	0.03	789.44	7.14	40	3.70	13	69
<i>Menticirrhus saxatilis</i>	16	0.0	2.9	0.05	0.03	915.01	6.43	20	1.01	11	30
<i>Lutjanus synagris</i>	15	0.0	4.2	0.04	0.02	586.03	2.86	36	3.26	19	61
<i>Mycteroperca microlepis</i>	8	0.0	1.3	0.02	0.02	984.40	2.86	138	9.15	111	184
<i>Farfantepenaeus aztecus</i>	8	0.0	1.3	0.02	0.02	1,192.02	4.29	20	1.28	15	26

Table AP07-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus duorarum</i>	7	0.0	1.7	0.02	0.01	853.07	2.14	17	0.36	15	18
<i>Trachinotus falcatus</i>	6	0.0	0.8	0.02	0.01	1,093.15	2.14	46	3.66	37	60
<i>Archosargus probatocephalus</i>	5	0.0	1.7	0.01	0.01	815.33	1.43	121	64.63	15	290
<i>Menticirrhus littoralis</i>	4	0.0	1.3	0.01	0.01	945.37	1.43	46	9.68	31	74
<i>Pomatomus saltatrix</i>	3	0.0	0.4	0.01	0.01	1,549.19	2.14	84	4.48	78	93
<i>Elops saurus</i>	2	0.0	0.8	0.01	0.00	1,093.15	0.71	174	131.50	42	305
<i>Trachinotus carolinus</i>	2	0.0	0.8	0.01	0.00	1,093.15	0.71	74	13.00	61	87
<i>Penaeidae</i> sp.	1	0.0	0.4	0.00	0.00	1,549.19	0.71	4	.	4	4
<i>Lutjanus jocu</i>	1	0.0	0.4	0.00	0.00	1,549.19	0.71	121	.	121	121
<i>Pogonias cromis</i>	1	0.0	0.4	0.00	0.00	1,549.19	0.71	263	.	263	263
<i>Scomberomorus maculatus</i>	1	0.0	0.4	0.00	0.00	1,549.19	0.71	132	.	132	132
<i>Paralichthys lethostigma</i>	1	0.0	0.4	0.00	0.00	1,549.19	0.71	16	.	16	16
Totals	13,638	26.3	77.5	40.59	6.89	262.82	1,030.00	.	.	2	305

Table AP07-04. Catch statistics for 10 dominant taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	16,734	37.1	89.4	77.47	7.71	146.18	588.00	110	0.18	43	195
<i>Brevoortia</i> spp.	9,203	20.4	7.9	42.61	35.47	1,223.47	7,604.00	113	0.23	60	210
<i>Leiostomus xanthurus</i>	4,322	9.6	55.1	20.01	3.99	293.38	616.00	133	0.45	41	269
<i>Micropogonias undulatus</i>	3,451	7.7	23.1	15.98	5.24	482.46	966.00	172	0.38	59	281
<i>Bairdiella chrysoura</i>	2,167	4.8	26.4	10.03	3.62	530.20	660.00	132	0.33	54	184
<i>Harengula jaguana</i>	1,882	4.2	15.3	8.71	3.71	626.05	567.00	93	0.20	69	129
<i>Mugil cephalus</i>	1,612	3.6	71.8	7.46	0.94	184.19	94.00	232	2.23	88	443
<i>Orthopristis chrysoptera</i>	771	1.7	33.8	3.57	0.64	263.18	71.00	125	1.22	37	200
<i>Dasyatis sabina</i>	599	1.3	44.0	2.77	0.92	487.64	184.00	224	2.16	105	387
<i>Mugil curema</i>	537	1.2	32.9	2.49	0.70	416.26	133.00	161	2.04	93	330
Subtotal	41,278	91.6	.	.	.	.	.	.	.	37	443
Totals	45,091	100.0	.	208.75	38.96	274.27	8,003.00	.	.	10	806

Table AP07-05. Catch statistics for Selected Taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	4,322	9.6	55.1	20.01	3.99	293.38	616.00	133	0.45	41	269
<i>Micropogonias undulatus</i>	3,451	7.7	23.1	15.98	5.24	482.46	966.00	172	0.38	59	281
<i>Mugil cephalus</i>	1,612	3.6	71.8	7.46	0.94	184.19	94.00	232	2.23	88	443
<i>Mugil curema</i>	537	1.2	32.9	2.49	0.70	416.26	133.00	161	2.04	93	330
<i>Sciaenops ocellatus</i>	505	1.1	44.0	2.34	0.42	264.89	53.00	366	4.21	116	661
<i>Elops saurus</i>	368	0.8	26.4	1.70	0.30	261.85	24.00	305	2.72	113	477
<i>Callinectes sapidus</i>	204	0.5	28.2	0.94	0.24	377.94	44.00	89	2.87	20	183
<i>Cynoscion nebulosus</i>	170	0.4	28.7	0.79	0.19	349.87	30.00	258	7.53	61	600
<i>Paralichthys albigutta</i>	141	0.3	30.1	0.65	0.10	221.37	11.00	150	5.34	57	312
<i>Archosargus probatocephalus</i>	133	0.3	22.7	0.62	0.13	299.07	16.00	314	5.34	65	418
<i>Mycteroperca microlepis</i>	126	0.3	14.4	0.58	0.14	363.47	17.00	148	3.89	55	233
<i>Pomatomus saltatrix</i>	96	0.2	12.0	0.44	0.14	450.87	23.00	162	8.16	93	397
<i>Menticirrhus americanus</i>	60	0.1	9.3	0.28	0.07	384.56	9.00	137	4.57	52	238
<i>Trachinotus carolinus</i>	58	0.1	1.4	0.27	0.18	1,007.78	31.00	83	2.75	49	140
<i>Pogonias cromis</i>	35	0.1	9.3	0.16	0.05	440.08	8.00	238	17.81	109	456
<i>Litopenaeus setiferus</i>	27	0.1	3.7	0.13	0.06	706.38	11.00	24	0.65	17	31
<i>Scomberomorus maculatus</i>	24	0.1	4.2	0.11	0.05	635.90	8.00	293	25.61	158	564

Table AP07-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lutjanus griseus</i>	17	0.0	4.6	0.08	0.03	502.75	3.00	149	6.34	93	191
<i>Lutjanus synagris</i>	16	0.0	2.8	0.07	0.04	796.36	6.00	93	3.93	61	133
<i>Paralichthys lethostigma</i>	15	0.0	5.6	0.07	0.02	460.20	3.00	277	18.74	151	356
<i>Farfantepenaeus aztecus</i>	15	0.0	2.8	0.07	0.04	773.02	7.00	19	0.69	15	25
<i>Menticirrhus littoralis</i>	13	0.0	3.2	0.06	0.03	681.95	5.00	219	13.02	128	308
<i>Farfantepenaeus duorarum</i>	13	0.0	2.3	0.06	0.04	879.33	7.00	23	1.37	16	32
<i>Paralichthys squamilentus</i>	9	0.0	1.4	0.04	0.03	1,164.59	7.00	59	7.98	45	121
<i>Farfantepenaeus</i> spp.	7	0.0	1.9	0.03	0.02	911.81	4.00	13	0.52	10	14
<i>Menticirrhus saxatilis</i>	7	0.0	1.9	0.03	0.02	911.81	4.00	126	4.44	114	143
<i>Trachinotus falcatus</i>	4	0.0	1.4	0.02	0.01	896.50	2.00	118	18.62	67	156
<i>Menippe</i> spp.	3	0.0	1.4	0.01	0.01	844.57	1.00	52	28.35	18	108
<i>Cynoscion arenarius</i>	1	0.0	0.5	0.00	0.00	1,469.69	1.00	230	.	230	230
Totals	11,989	26.6	96.3	55.50	7.51	198.76	992.00	.	.	10	661

Table AP07-06. Catch statistics for 10 dominant taxa collected in 144 bay 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	7,687	38.2	43.8	3.51	0.78	265.13	74.14	39	0.17	8	82
<i>Micropogonias undulatus</i>	1,940	9.6	38.9	0.88	0.39	527.02	45.55	32	0.77	8	180
<i>Lagodon rhomboides</i>	1,612	8.0	52.8	0.74	0.19	313.79	20.44	79	0.63	13	198
<i>Leiostomus xanthurus</i>	1,372	6.8	56.3	0.63	0.22	415.56	25.63	107	0.61	11	200
<i>Cynoscion arenarius</i>	1,111	5.5	26.4	0.52	0.13	294.54	9.65	40	0.84	8	175
<i>Orthopristis chrysoptera</i>	753	3.7	39.6	0.35	0.08	262.80	6.41	94	1.27	11	175
<i>Microgobius thalassinus</i>	633	3.1	36.1	0.29	0.10	424.85	10.59	18	0.24	8	35
<i>Etropus crossotus</i>	503	2.5	67.4	0.23	0.03	144.40	1.89	72	0.78	24	125
<i>Rimapenaeus constrictus</i>	465	2.3	38.9	0.21	0.07	408.89	9.96	5	0.14	2	18
<i>Ariopsis felis</i>	456	2.3	41.7	0.21	0.05	262.59	4.18	95	2.17	41	304
Subtotal	16,532	82.0	.	.	.	.	.	.	.	2	304
Totals	20,149	100.0	.	9.23	1.06	138.13	85.87	.	.	2	955

Table AP07-07. Catch statistics for Selected Taxa collected in 144 bay 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Micropogonias undulatus</i>	1,940	9.6	38.9	0.88	0.39	527.02	45.55	32	0.77	8	180
<i>Leiostomus xanthurus</i>	1,372	6.8	56.3	0.63	0.22	415.56	25.63	107	0.61	11	200
<i>Cynoscion arenarius</i>	1,111	5.5	26.4	0.52	0.13	294.54	9.65	40	0.84	8	175
<i>Farfantepenaeus aztecus</i>	272	1.3	16.7	0.13	0.04	360.09	3.85	23	0.29	15	35
<i>Farfantepenaeus duorarum</i>	186	0.9	34.7	0.09	0.02	219.46	1.55	22	0.38	15	40
<i>Lutjanus synagris</i>	180	0.9	18.1	0.08	0.04	645.45	6.27	34	1.62	16	124
<i>Farfantepenaeus</i> spp.	162	0.8	25.0	0.07	0.02	350.77	2.31	12	0.17	5	17
<i>Menticirrhus americanus</i>	146	0.7	21.5	0.07	0.02	381.11	1.80	64	3.49	10	259
<i>Callinectes sapidus</i>	128	0.6	34.7	0.06	0.01	239.26	0.90	90	4.94	9	184
<i>Litopenaeus setiferus</i>	59	0.3	15.3	0.03	0.01	361.87	0.85	19	0.78	8	35
<i>Paralichthys albigutta</i>	57	0.3	18.8	0.03	0.01	274.05	0.45	135	6.34	55	231
<i>Menippe</i> spp.	52	0.3	16.0	0.02	0.01	433.37	1.09	17	2.40	4	84
<i>Cynoscion nothus</i>	8	0.0	2.8	0.00	0.00	633.88	0.20	59	9.08	22	94
<i>Cynoscion nebulosus</i>	6	0.0	3.5	0.00	0.00	558.72	0.13	188	53.34	34	356
<i>Mycteroperca microlepis</i>	2	0.0	0.7	0.00	0.00	1,200.00	0.13	133	2.00	131	135
<i>Paralichthys lethostigma</i>	2	0.0	1.4	0.00	0.00	845.56	0.06	254	57.50	196	311
<i>Pomatomus saltatrix</i>	1	0.0	0.7	0.00	0.00	1,200.00	0.07	140	.	140	140

Table AP07-07. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lutjanus griseus</i>	1	0.0	0.7	0.00	0.00	1,200.00	0.06	13	.	13	13
<i>Pogonias cromis</i>	1	0.0	0.7	0.00	0.00	1,200.00	0.06	202	.	202	202
<i>Menticirrhus saxatilis</i>	1	0.0	0.7	0.00	0.00	1,200.00	0.06	113	.	113	113
Totals	5,687	28.2	89.6	2.61	0.49	227.43	45.87	.	.	4	356

Table AP07-08. Catch statistics for 10 dominant taxa collected in 155 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Menidia</i> spp.	2,765	15.8	36.1	26.23	5.87	278.62	501.47	40	0.22	16	95
<i>Anchoa mitchilli</i>	2,639	15.0	27.1	25.04	7.41	368.36	601.47	28	0.14	17	70
<i>Trinectes maculatus</i>	1,480	8.4	49.7	14.04	3.61	320.03	369.12	18	0.21	7	60
<i>Brevoortia</i> spp.	1,451	8.3	12.3	13.77	8.70	786.91	1,073.53	23	0.04	19	35
<i>Lucania parva</i>	1,299	7.4	27.7	12.32	3.88	392.31	320.59	26	0.12	11	37
<i>Lagodon rhomboides</i>	1,139	6.5	37.4	10.81	3.58	412.61	400.00	32	0.55	14	138
<i>Eucinostomus</i> spp.	735	4.2	34.2	6.97	1.65	294.82	148.53	27	0.23	12	39
<i>Callinectes sapidus</i>	653	3.7	63.9	6.20	0.91	182.99	95.59	16	0.70	3	160
<i>Micropterus salmoides</i>	577	3.3	40.6	5.47	2.95	670.51	452.94	43	2.32	16	366
<i>Lepomis macrochirus</i>	423	2.4	27.1	4.01	0.85	263.78	57.35	58	1.09	23	148
Subtotal	13,161	75.0	.	.	.	.	.	.	.	3	366
Totals	17,550	100.0	.	166.51	19.45	145.41	1,692.65	.	.	2	554

Table AP07-09. Catch statistics for Selected Taxa collected in 155 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Callinectes sapidus</i>	653	3.7	63.9	6.20	0.91	182.99	95.59	16	0.70	3	160
<i>Farfantepenaeus</i> spp.	328	1.9	34.2	3.11	0.68	271.84	52.94	6	0.14	2	14
<i>Litopenaeus setiferus</i>	180	1.0	12.3	1.71	0.91	665.17	136.76	5	0.18	2	20
<i>Leiostomus xanthurus</i>	79	0.5	6.5	0.75	0.46	766.89	66.18	79	4.50	23	180
<i>Mugil cephalus</i>	63	0.4	3.9	0.60	0.40	827.81	48.53	23	0.18	18	28
<i>Cynoscion nebulosus</i>	38	0.2	10.3	0.36	0.12	400.79	13.24	44	3.64	18	100
<i>Cynoscion arenarius</i>	25	0.1	3.2	0.24	0.16	828.46	23.53	37	2.08	22	70
<i>Archosargus probatocephalus</i>	17	0.1	5.2	0.16	0.06	493.61	5.88	123	29.81	14	404
<i>Lutjanus griseus</i>	14	0.1	3.9	0.13	0.07	635.48	8.82	48	5.75	22	83
<i>Micropogonias undulatus</i>	10	0.1	2.6	0.09	0.05	653.26	4.41	21	2.35	12	32
<i>Sciaenops ocellatus</i>	6	0.0	2.6	0.06	0.03	714.11	4.41	142	75.01	20	415
<i>Mugil curema</i>	4	0.0	1.3	0.04	0.03	982.33	4.41	47	6.78	27	57
<i>Elops saurus</i>	2	0.0	1.3	0.02	0.01	877.48	1.47	48	10.50	37	58
<i>Farfantepenaeus aztecus</i>	1	0.0	0.6	0.01	0.01	1,244.99	1.47	19	.	19	19
<i>Pomatomus saltatrix</i>	1	0.0	0.6	0.01	0.01	1,244.99	1.47	59	.	59	59
<i>Paralichthys lethostigma</i>	1	0.0	0.6	0.01	0.01	1,244.99	1.47	390	.	390	390
Totals	1,422	8.1	77.4	13.49	2.04	188.10	204.41	.	.	2	415

Table AP07-10. Catch statistics for 10 dominant taxa collected in 84 river 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	39,707	69.9	64.3	64.80	20.46	289.34	1,374.80	26	0.03	12	63
<i>Micropogonias undulatus</i>	4,211	7.4	46.4	6.75	3.14	425.97	217.08	19	0.21	7	199
<i>Cynoscion arenarius</i>	4,044	7.1	45.2	6.44	1.81	257.84	119.13	30	0.23	8	152
<i>Litopenaeus setiferus</i>	2,030	3.6	32.1	3.27	1.23	345.17	72.45	8	0.11	3	20
<i>Leiostomus xanthurus</i>	1,270	2.2	42.9	2.01	1.19	542.86	98.22	64	1.45	14	200
<i>Eucinostomus</i> spp.	1,036	1.8	36.9	1.67	0.62	340.77	47.76	22	0.23	6	39
<i>Farfantepenaeus</i> spp.	910	1.6	45.2	1.45	0.66	420.67	52.89	7	0.10	2	14
<i>Microgobius thalassinus</i>	736	1.3	23.8	1.18	0.50	390.98	34.40	17	0.18	10	34
<i>Trinectes maculatus</i>	674	1.2	53.6	1.10	0.42	350.55	29.55	20	0.59	7	78
<i>Callinectes sapidus</i>	591	1.0	71.4	0.93	0.26	261.15	16.44	33	1.91	4	188
Subtotal	55,209	97.1	.	.	.	.	.	.	.	2	200
Totals	56,789	100.0	.	92.09	22.26	221.53	1,401.18	.	.	2	615

Table AP07-11. Catch statistics for Selected Taxa collected in 84 river 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Micropogonias undulatus</i>	4,211	7.4	46.4	6.75	3.14	425.97	217.08	19	0.21	7	199
<i>Cynoscion arenarius</i>	4,044	7.1	45.2	6.44	1.81	257.84	119.13	30	0.23	8	152
<i>Litopenaeus setiferus</i>	2,030	3.6	32.1	3.27	1.23	345.17	72.45	8	0.11	3	20
<i>Leiostomus xanthurus</i>	1,270	2.2	42.9	2.01	1.19	542.86	98.22	64	1.45	14	200
<i>Farfantepenaeus</i> spp.	910	1.6	45.2	1.45	0.66	420.67	52.89	7	0.10	2	14
<i>Callinectes sapidus</i>	591	1.0	71.4	0.93	0.26	261.15	16.44	33	1.91	4	188
<i>Menticirrhus americanus</i>	74	0.1	21.4	0.12	0.05	352.76	3.24	28	2.61	8	170
<i>Cynoscion nebulosus</i>	56	0.1	13.1	0.09	0.06	623.83	5.13	46	7.62	10	257
<i>Archosargus probatocephalus</i>	52	0.1	19.0	0.08	0.05	538.58	4.05	159	15.48	31	434
<i>Farfantepenaeus aztecus</i>	26	0.0	7.1	0.04	0.02	467.97	1.35	17	0.34	15	21
<i>Paralichthys lethostigma</i>	17	0.0	14.3	0.03	0.01	283.23	0.40	230	20.02	77	406
<i>Sciaenops ocellatus</i>	8	0.0	3.6	0.01	0.01	628.67	0.67	284	34.29	51	354
<i>Lutjanus griseus</i>	5	0.0	4.8	0.01	0.00	474.67	0.27	47	13.94	19	95
<i>Pogonias cromis</i>	5	0.0	3.6	0.01	0.00	543.99	0.27	211	14.41	179	261
<i>Mugil cephalus</i>	3	0.0	1.2	0.00	0.00	916.52	0.40	172	28.87	122	222
<i>Lutjanus synagris</i>	1	0.0	1.2	0.00	0.00	916.52	0.13	36	.	36	36
<i>Menticirrhus saxatilis</i>	1	0.0	1.2	0.00	0.00	916.52	0.13	10	.	10	10
Totals	13,304	23.4	89.3	21.23	4.62	199.21	222.61	.	.	2	434

Appendix AP07-01. Monthly summary of species collected during Apalachicola Bay stratified-random sampling, 2007. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	
<i>Acanthostracion quadricornis</i>	3	1	.	.	1	1	.	.	5	3	.	.	14
<i>Achirus lineatus</i>	1	.	1	.	.	1	.	.	1	.	.	.	4
<i>Adinia xenica</i>	3	.	1	.	.	.	.	.	.	.	25	22	51
<i>Alosa chrysochloris</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Aluterus schoepfii</i>	.	.	.	.	.	.	1	.	1	.	1	.	3
<i>Ameiurus catus</i>	.	1	.	.	1	.	1	.	.	.	.	.	3
<i>Amia calva</i>	.	.	2	.	.	.	.	.	1	.	.	.	3
<i>Anchoa cubana</i>	.	.	.	3	21	11	1	.	2	.	3	1	42
<i>Anchoa hepsetus</i>	.	.	.	4	1,036	503	91	47	28	11	2	.	1,722
<i>Anchoa lyolepis</i>	.	.	.	.	1	2	1	.	.	.	.	.	4
<i>Anchoa mitchilli</i>	36	388	1,238	535	7,666	4,077	7,436	17,501	6,720	3,655	3,063	8,215	60,530
<i>Anchoa</i> spp.	.	.	.	.	1	1	.	.	.	.	.	.	2
<i>Ancylopsetta quadrocellata</i>	1	1	10	10	11	4	3	1	7	.	1	1	50
<i>Archosargus probatocephalus</i>	3	4	10	4	21	24	11	23	11	24	25	47	207
<i>Ariopsis felis</i>	.	2	41	66	66	161	420	285	223	144	8	39	1,455
<i>Astroscopus y-graecum</i>	.	1	.	2	.	.	.	.	.	.	.	.	3
<i>Bagre marinus</i>	.	.	.	.	5	29	3	22	12	19	.	1	91
<i>Bairdiella chrysoura</i>	9	8	7	679	295	296	815	522	324	509	64	7	3,535
<i>Bathygobius soporator</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Blenniidae</i> sp.	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Brevoortia</i> spp.	6	100	766	3,523	1,451	10	723	143	24	7,649	.	.	14,395
<i>Calamus arctifrons</i>	.	.	.	2	.	.	.	.	.	.	.	.	2
<i>Callinectes sapidus</i>	246	342	146	120	288	391	180	203	204	54	117	122	2,413
<i>Callinectes similis</i>	4	3	7	33	5	11	52	3	8	.	7	9	142

Appendix AP07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=839
<i>Caranx hippos</i>	.	.	.	.	1	.	.	13	10	61	.	.	85
<i>Caranx latus</i>	.	.	.	.	.	.	1	4	6	4	2	.	17
<i>Carcharhinus brevipinna</i>	.	.	.	.	.	1	2	1	.	.	.	.	4
<i>Carcharhinus isodon</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Carcharhinus limbatus</i>	.	.	.	.	.	1	.	1	.	.	.	.	2
<i>Centropristis philadelphica</i>	.	.	.	.	1	3	1	2	.	.	1	.	8
<i>Centropristis striata</i>	.	.	.	.	.	.	4	.	5	1	1	.	11
<i>Chaetodipterus faber</i>	.	.	9	1	5	3	2	5	9	2	1	.	37
<i>Chasmodes saburrae</i>	.	.	.	.	.	.	.	.	1	.	.	1	2
<i>Chilomycterus schoepfii</i>	4	1	3	3	14	9	8	3	19	16	6	13	99
<i>Chloroscombrus chrysurus</i>	.	.	.	.	1	2	9	41	62	41	.	.	156
<i>Citharichthys macrops</i>	13	10	1	5	11	5	4	3	8	4	1	3	68
<i>Citharichthys spilopterus</i>	.	2	2	4	5	22	12	7	3	1	.	.	58
<i>Ctenogobius boleosoma</i>	77	54	124	279	38	82	32	43	223	38	76	67	1,133
<i>Cynoscion arenarius</i>	.	.	2	135	788	1,183	506	1,352	1,813	97	9	12	5,897
<i>Cynoscion nebulosus</i>	3	4	5	13	9	35	36	152	60	40	10	39	406
<i>Cynoscion nothus</i>	.	.	1	.	2	.	.	2	.	.	.	3	8
<i>Cyprinella venusta</i>	19	12	1	30	38	74	.	1	.	.	28	53	256
<i>Cyprinodon variegatus</i>	8	.	.	4	.	.	.	.	.	.	.	2	14
<i>Cyprinus carpio</i>	1	.	1	.	.	1	.	.	.	.	.	.	3
<i>Dactyloscopus moorei</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Dasyatis sabina</i>	12	18	28	23	294	47	93	57	40	46	19	8	685
<i>Dasyatis say</i>	.	.	1	2	20	8	8	19	6	2	.	.	66
<i>Diplectrum bivittatum</i>	.	.	.	.	.	.	1	.	.	.	.	.	1

Appendix AP07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=839
<i>Diplectrum formosum</i>	.	.	.	.	1	.	2	.	.	2	.	.	5
<i>Diplodus holbrookii</i>	.	.	.	2	.	2	.	.	3	.	.	.	7
<i>Dormitator maculatus</i>	.	.	.	.	.	.	.	.	.	.	2	.	2
<i>Dorosoma cepedianum</i>	.	.	.	.	.	.	.	1	.	10	.	.	11
<i>Dorosoma petenense</i>	.	.	.	.	2	37	.	2	3	7	.	.	51
<i>Echeneis neucratoides</i>	.	.	.	.	.	.	1	.	.	3	1	.	5
<i>Elops saurus</i>	2	.	1	.	72	92	35	52	22	90	6	.	372
<i>Enneacanthus gloriosus</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Erimyzon sucetta</i>	.	.	1	.	.	.	.	1	.	.	.	.	2
<i>Erotelis smaragdus</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Esox niger</i>	.	.	1	2	1	.	.	.	.	.	.	.	4
<i>Etheostoma edwini</i>	.	.	1	.	.	.	.	1	.	.	2	2	6
<i>Etheostoma fusiforme</i>	1	.	.	.	.	.	.	1	.	.	1	.	3
<i>Etropus crossotus</i>	32	15	38	33	30	5	56	134	113	51	30	54	591
<i>Etropus cyclosquamus</i>	.	.	1	3	2	26	17	1	.	1	3	4	58
<i>Eucinostomus argenteus</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Eucinostomus gula</i>	12	18	4	1	9	24	7	215	39	27	51	22	429
<i>Eucinostomus harengulus</i>	7	1	.	.	.	1	.	97	86	28	54	50	324
<i>Eucinostomus spp.</i>	28	.	.	.	.	.	537	637	1,404	737	401	348	4,092
<i>Farfantepenaeus aztecus</i>	.	.	.	.	1	146	104	62	7	1	1	.	322
<i>Farfantepenaeus duorarum</i>	8	20	22	59	43	8	.	1	19	10	12	4	206
<i>Farfantepenaeus spp.</i>	31	43	30	71	122	178	157	326	922	163	104	157	2,304
<i>Fundulus chrysotus</i>	1	.	.	17	.	.	.	.	.	.	10	.	28
<i>Fundulus confluentus</i>	3	.	.	1	.	.	.	.	.	.	.	3	7
<i>Fundulus grandis</i>	6	4	13	28	.	.	3	.	2	.	46	12	114
<i>Fundulus similis</i>	1	20	6	8	13	15	50	2	2	.	.	9	126

Appendix AP07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=839
<i>Gambusia holbrooki</i>	66	.	.	80	12	.	.	1	1	.	148	75	383
<i>Gobionellus oceanicus</i>	.	1	1	2	1	2	1	7	19	3	.	.	37
<i>Gobiosoma bosc</i>	13	30	6	39	3	6	31	16	19	7	23	55	248
<i>Gobiosoma longipala</i>	.	5	3	6	2	.	.	.	.	.	.	1	17
<i>Gobiosoma robustum</i>	4	.	3	.	.	.	.	.	.	.	.	8	15
<i>Gobiosoma spp.</i>	26	11	2	1	4	5	28	18	12	3	38	9	157
<i>Graptemys barbouri</i>	.	.	.	1	.	.	.	.	.	.	.	1	2
<i>Gymnura micrura</i>	.	.	.	6	4	1	1	2	8	.	.	.	22
<i>Haemulon plumierii</i>	.	.	.	.	.	.	1	.	.	.	.	2	3
<i>Halichoeres bivittatus</i>	.	.	.	.	.	.	2	10	8	12	1	.	33
<i>Harengula jaguana</i>	.	.	.	102	1,105	321	6	2	319	208	19	4	2,086
<i>Hemicaranx amblyrhynchus</i>	.	.	.	.	.	.	1	5	7	8	.	.	21
<i>Heterandria formosa</i>	28	.	.	34	1	.	.	.	.	.	5	7	75
<i>Hippocampus erectus</i>	3	2	3	5	3	3	2	2	5	2	3	8	41
<i>Hypleurochilus multifilis</i>	1	.	.	.	.	.	.	.	.	.	.	.	1
<i>Hyporhamphus meeki</i>	.	.	1	.	14	2	2	33	1	13	.	6	72
<i>Hypsoblennius hentz</i>	.	.	.	.	.	.	.	2	.	2	2	1	7
<i>Ictalurus furcatus</i>	.	2	.	.	4	1	.	.	.	.	.	.	7
<i>Ictalurus punctatus</i>	4	2	2	3	40	3	.	1	.	.	.	.	55
<i>Labidesthes sicculus</i>	7	4	5	2	3	22	3	19	3	2	11	.	81
<i>Lagodon rhomboides</i>	484	814	6,353	4,651	4,217	2,942	2,376	1,876	2,701	2,213	1,329	1,027	30,983
<i>Leiostomus xanthurus</i>	1,574	2,295	2,258	1,567	1,225	1,219	620	525	846	493	273	134	13,029
<i>Lepisosteus oculatus</i>	.	.	.	4	2	.	1	2	3	1	.	.	13
<i>Lepisosteus osseus</i>	.	1	1	.	.	2	1	.	1	9	.	2	17
<i>Lepomis auritus</i>	6	.	1	4	.	.	1	.	2	.	69	7	90
<i>Lepomis macrochirus</i>	37	25	66	100	25	10	15	58	31	.	62	.	429

Appendix AP07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=839
<i>Lepomis microlophus</i>	54	7	15	20	4	4	20	9	34	6	10	2	185
<i>Lepomis punctatus</i>	1	.	4	3	.	.	2	1	10	.	31	3	55
<i>Lepomis</i> spp.	.	1	.	.	9	2	.	3	.	.	1	.	16
<i>Limulus polyphemus</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Litopenaeus setiferus</i>	4	.	7	3	.	2	619	983	737	39	111	8	2,513
<i>Lucania goodei</i>	1	.	1	.	.	.	.	.	.	.	3	.	5
<i>Lucania parva</i>	263	2	215	227	6	226	14	32	901	.	89	444	2,419
<i>Lutjanus griseus</i>	.	.	.	.	1	2	5	6	32	7	5	2	60
<i>Lutjanus jocu</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Lutjanus synagris</i>	.	.	.	.	.	.	117	41	28	25	.	1	212
<i>Macrochelys temminckii</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Malaclemys terrapin</i>	.	.	.	7	.	.	.	.	.	.	.	.	7
<i>Membras martinica</i>	.	.	.	62	8	19	70	38	40	3	.	.	240
<i>Menidia</i> spp.	175	352	60	232	545	1,085	441	870	846	207	181	89	5,083
<i>Menippe</i> spp.	6	5	4	21	2	.	2	3	1	4	3	4	55
<i>Menticirrhus americanus</i>	3	.	.	9	38	82	36	96	100	26	13	11	414
<i>Menticirrhus littoralis</i>	1	.	2	.	2	.	1	7	.	1	2	1	17
<i>Menticirrhus saxatilis</i>	.	.	.	14	1	3	5	1	.	1	.	.	25
<i>Microgobius gulosus</i>	1	1	1	2	24	6	8	21	21	3	2	6	96
<i>Microgobius thalassinus</i>	14	35	6	18	13	196	347	334	309	272	100	9	1,653
<i>Micropogonias undulatus</i>	977	1,051	47	780	386	1,146	261	1,754	213	207	153	3,154	10,129
<i>Micropterus salmoides</i>	10	1	12	334	69	52	10	61	21	.	6	4	580
<i>Minytrema melanops</i>	.	.	.	.	1	11	.	.	.	.	.	.	12
<i>Monacanthus ciliatus</i>	4	3	2	1	1	1	1	.	4	3	8	3	31
<i>Morone saxatilis</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Mugil cephalus</i>	2,349	540	186	729	157	181	90	103	140	108	58	227	4,868

Appendix AP07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=839
<i>Mugil curema</i>	162	9	2	53	684	16	241	23	101	40	24	34	1,389
<i>Mycteroperca microlepis</i>	.	.	.	.	.	9	25	16	53	31	2	.	136
<i>Myrophis punctatus</i>	.	2	.	1	.	.	.	1	.	1	.	.	5
<i>Narcine bancroftii</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Nicholsina usta</i>	.	.	.	.	.	4	.	.	1	.	6	.	11
<i>Notemigonus crysoleucas</i>	1	.	10	.	12	1	19	20	24	.	.	.	87
<i>Notropis maculatus</i>	21	.	.	.	.	.	4	1	.	.	.	.	26
<i>Notropis petersoni</i>	55	2	40	47	4	30	51	40	19	2	63	10	363
<i>Notropis texanus</i>	.	.	.	.	9	12	.	.	.	.	.	.	21
<i>Ogcocephalus cubifrons</i>	.	.	.	2	3	1	.	1	.	.	1	2	10
<i>Oligoplites saurus</i>	.	.	.	.	.	.	10	19	17	12	.	1	59
<i>Opisthonema oglinum</i>	.	.	.	5	.	.	.	.	.	1	.	.	6
<i>Opsanus beta</i>	.	.	.	.	.	7	13	1	7	2	2	.	32
<i>Opsopoeodus emiliae</i>	.	1	1	2	.	14	.	2	.	.	.	.	20
<i>Orthopristis chrysoptera</i>	15	77	99	217	777	528	326	169	317	251	35	26	2,837
<i>Paralichthys albigutta</i>	2	10	15	25	21	31	34	18	46	17	2	3	224
<i>Paralichthys lethostigma</i>	3	9	3	2	3	6	1	3	1	3	2	.	36
<i>Paralichthys spp.</i>	.	4	2	.	.	.	.	.	.	.	.	.	6
<i>Paralichthys squamilentus</i>	.	7	1	1	.	.	.	.	.	.	.	.	9
<i>Penaeidae sp.</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Peprilus burti</i>	1	1	1	12	4	3	1	.	.	.	.	.	23
<i>Peprilus paru</i>	.	.	1	5	11	12	17	2	2	10	11	2	73
<i>Percina nigrofasciata</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Platybelone argalus</i>	.	.	.	.	.	.	.	2	.	.	.	.	2
<i>Poecilia latipinna</i>	.	.	.	9	.	.	1	.	1	.	33	29	73
<i>Pogonias cromis</i>	.	.	.	1	4	1	1	3	9	4	6	13	42

Appendix AP07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=839
<i>Pomatomus saltatrix</i>	.	.	.	27	22	12	31	1	2	4	1	1	101
<i>Pomoxis nigromaculatus</i>	.	.	2	.	.	.	.	.	.	.	.	.	2
<i>Porichthys plectrodon</i>	.	.	.	.	3	25	10	7	6	.	.	.	51
<i>Portunus</i> spp.	5	3	4	4	8	27	56	7	8	4	7	8	141
<i>Prionotus longispinosus</i>	.	.	.	8	16	.	1	.	.	.	.	.	25
<i>Prionotus rubio</i>	.	.	.	.	2	1	3	.	2	1	.	.	9
<i>Prionotus scitulus</i>	17	17	21	11	7	17	40	27	39	28	12	41	277
<i>Prionotus tribulus</i>	29	13	25	11	15	6	6	2	21	16	22	33	199
<i>Pseudemys nelsoni</i>	.	.	.	1	1	.	.	.	.	.	1	2	5
<i>Pseudemys suwanniensis</i>	.	.	1	.	.	.	1	.	.	.	.	.	2
<i>Raja eglanteria</i>	.	.	.	.	.	.	.	.	.	.	.	1	1
<i>Rhinoptera bonasus</i>	.	.	2	.	17	3	4	13	.	1	.	1	41
<i>Rhizoprionodon terraenovae</i>	.	.	.	.	.	.	2	.	.	.	.	.	2
<i>Rimapenaeus constrictus</i>	23	18	5	8	6	6	14	64	206	295	39	27	711
<i>Sardinella aurita</i>	.	.	.	.	1	3	.	.	.	.	.	.	4
<i>Sciaenops ocellatus</i>	13	38	43	73	131	45	34	12	40	29	53	38	549
<i>Scomberomorus maculatus</i>	.	.	1	8	1	3	3	6	1	2	.	.	25
<i>Scorpaena brasiliensis</i>	.	.	.	.	1	.	.	.	.	.	.	.	1
<i>Selene setapinnis</i>	.	.	.	.	.	.	2	.	.	.	.	.	2
<i>Selene vomer</i>	.	.	.	.	1	1	5	2	9	6	.	.	24
<i>Serraniculus pumilio</i>	.	3	1	1	1	1	.	.	3	5	2	.	17
<i>Serranus subligarius</i>	.	.	.	.	.	.	.	.	3	1	1	.	5
<i>Sicyonia dorsalis</i>	1	.	.	.	.	1	.	.	.	.	.	.	2
<i>Sicyonia laevigata</i>	.	.	.	1	.	.	.	.	1	.	.	.	2
<i>Sphoeroides nephelus</i>	1	.	.	.	.	4	.	2	2	2	3	5	19
<i>Sphoeroides</i> spp.	.	.	.	3	10	3	.	.	1	3	6	.	26

Appendix AP07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=69	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=839
<i>Sphyraena borealis</i>	.	.	.	.	2	15	.	.	.	.	.	.	17
<i>Sphyraena guachancho</i>	.	.	.	.	.	.	2	.	.	.	.	.	2
<i>Sphyrna tiburo</i>	.	.	.	.	.	.	.	1	.	3	.	.	4
<i>Stellifer lanceolatus</i>	.	.	.	.	.	.	2	.	.	.	.	.	2
<i>Stenotomus caprinus</i>	.	.	.	.	4	3	.	.	.	.	.	.	7
<i>Stephanolepis hispidus</i>	1	1	.	.	4	29	114	9	33	5	11	4	211
<i>Stomolophus meleagris</i>	.	.	.	.	.	2	5	39	36	42	17	1	142
<i>Strongylura marina</i>	5	6	45	25	13	10	10	10	3	11	13	25	176
<i>Strongylura notata</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Strongylura</i> spp.	.	.	.	.	12	1	1	.	.	.	.	.	14
<i>Symphurus plagiusa</i>	8	9	13	17	10	11	56	221	189	31	43	11	619
<i>Syngnathus floridae</i>	.	.	3	2	1	7	2	15	16	6	11	10	73
<i>Syngnathus louisianae</i>	1	1	2	1	16	15	20	7	5	4	5	7	84
<i>Syngnathus scovelli</i>	16	7	32	12	5	5	5	19	4	2	13	5	125
<i>Synodus foetens</i>	2	3	1	6	80	80	94	35	38	37	19	9	404
<i>Trachinotus carolinus</i>	.	.	.	.	.	.	25	32	2	1	.	.	60
<i>Trachinotus falcatus</i>	.	.	.	.	.	.	.	.	6	1	.	3	10
<i>Trichiurus lepturus</i>	.	.	1	.	1	2	1	.	.	.	1	.	6
<i>Trinectes maculatus</i>	352	108	147	519	100	114	81	194	314	110	212	142	2,393
<i>Tylosurus crocodilus</i>	.	.	.	.	.	.	.	.	2	.	.	.	2
<i>Urophycis floridana</i>	2	10	9	10	1	.	.	.	.	.	.	2	34
<i>Urophycis regia</i>	.	.	1	.	.	.	.	.	.	.	.	.	1
<i>Xiphopenaeus kroyeri</i>	.	.	.	.	.	.	.	5	.	.	.	.	5
Totals	7,433	6,622	12,328	15,906	22,348	16,216	17,942	29,984	21,474	18,466	7,635	15,141	191,495

Appendix AP07-02. Summary by gear, stratum, and zone of species collected during Apalachicola Bay stratified-random sampling, 2007. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine, 183-m haul seine, and 6.1-m otter trawl were not stratified. Zones A and B were located in Apalachicola Bay, and Zone C encompassed the lower Apalachicola River. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata						Zone			Totals E=839
	21.3-m bay seine			21.3-m river seine E=155	183-m haul seine E=216	6.1-m otter trawl E=228	A E=301	B E=299	C E=239	
	Veg E=63	Unveg E=69	Shore E=108							
<i>Acanthostracion quadricornis</i>	.	.	.	.	4	10	.	14	.	14
<i>Achirus lineatus</i>	.	.	1	.	.	3	1	3	.	4
<i>Adinia xenica</i>	.	.	4	47	.	.	3	1	47	51
<i>Alosa chrysochloris</i>	.	.	.	.	1	.	.	1	.	1
<i>Aluterus schoepfii</i>	.	1	.	.	2	.	1	2	.	3
<i>Ameiurus catus</i>	.	.	.	1	.	2	.	.	3	3
<i>Amia calva</i>	.	.	.	3	.	.	.	.	3	3
<i>Anchoa cubana</i>	2	10	.	.	.	30	11	31	.	42
<i>Anchoa hepsetus</i>	349	37	983	334	1	18	217	1,168	337	1,722
<i>Anchoa lyolepis</i>	.	1	2	1	.	.	3	.	1	4
<i>Anchoa mitchilli</i>	61	4,439	5,995	2,639	2	47,394	17,040	1,144	42,346	60,530
<i>Anchoa</i> spp.	.	.	.	.	.	2	2	.	.	2
<i>Ancylopsetta quadrocellata</i>	1	.	.	.	8	41	14	36	.	50
<i>Archosargus probatocephalus</i>	4	.	1	17	133	52	29	109	69	207
<i>Ariopsis felis</i>	3	193	196	.	507	556	1,058	297	100	1,455
<i>Astroscopus y-graecum</i>	.	.	1	.	2	.	1	2	.	3
<i>Bagre marinus</i>	.	5	1	.	62	23	82	5	4	91
<i>Bairdiella chrysoura</i>	733	29	36	421	2,167	149	1,074	2,030	431	3,535
<i>Bathygobius soporator</i>	.	.	.	1	.	.	.	.	1	1
<i>Blenniidae</i> sp.	.	.	.	.	.	1	.	1	.	1
<i>Brevoortia</i> spp.	.	765	2,972	1,451	9,203	4	12,927	13	1,455	14,395
<i>Calamus arctifrons</i>	.	.	.	.	.	2	.	2	.	2
<i>Callinectes sapidus</i>	92	179	566	653	204	719	989	180	1,244	2,413
<i>Callinectes similis</i>	1	1	30	.	1	109	91	50	1	142
<i>Caranx hippos</i>	.	.	2	.	82	1	81	3	1	85
<i>Caranx latus</i>	.	.	.	1	16	.	9	7	1	17

Appendix AP07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	
	Veg	Unveg	Shore							
	E=63	E=69	E=108	E=155	E=216	E=228	E=301	E=299	E=239		E=839
<i>Carcharhinus brevipinna</i>	.	.	.	.	4	.	.	4	.	4
<i>Carcharhinus isodon</i>	.	.	.	.	1	.	1	.	.	1
<i>Carcharhinus limbatus</i>	.	.	.	.	2	.	1	1	.	2
<i>Centropristis philadelphica</i>	.	.	.	.	.	8	3	5	.	8
<i>Centropristis striata</i>	1	.	.	.	8	2	1	10	.	11
<i>Chaetodipterus faber</i>	.	.	.	.	5	32	24	12	1	37
<i>Chasmodes saburrae</i>	1	.	1	.	.	.	.	2	.	2
<i>Chilomycterus schoepfii</i>	12	5	.	.	63	19	11	88	.	99
<i>Chloroscombrus chrysurus</i>	7	39	5	.	23	82	71	84	1	156
<i>Citharichthys macrops</i>	.	3	3	.	14	48	13	54	1	68
<i>Citharichthys spilopterus</i>	.	2	3	.	24	29	39	4	15	58
<i>Ctenogobius boleosoma</i>	61	58	615	283	.	116	710	71	352	1,133
<i>Cynoscion arenarius</i>	.	95	621	25	1	5,155	1,705	123	4,069	5,897
<i>Cynoscion nebulosus</i>	88	5	43	38	170	62	179	133	94	406
<i>Cynoscion nothus</i>	.	.	.	.	.	8	8	.	.	8
<i>Cyprinella venusta</i>	.	.	.	256	.	.	.	.	256	256
<i>Cyprinodon variegatus</i>	.	.	8	1	5	.	2	11	1	14
<i>Cyprinus carpio</i>	.	.	.	1	.	2	.	.	3	3
<i>Dactyloscopus moorei</i>	.	1	.	.	.	.	.	1	.	1
<i>Dasyatis sabina</i>	1	6	9	2	599	68	518	160	7	685
<i>Dasyatis say</i>	.	.	.	.	60	6	18	48	.	66
<i>Diplectrum bivittatum</i>	.	.	.	.	.	1	1	.	.	1
<i>Diplectrum formosum</i>	.	.	.	.	.	5	4	1	.	5
<i>Diplodus holbrookii</i>	4	.	.	.	2	1	.	7	.	7
<i>Dormitator maculatus</i>	.	.	.	2	.	.	.	.	2	2
<i>Dorosoma cepedianum</i>	.	.	1	.	10	.	11	.	.	11
<i>Dorosoma petenense</i>	.	.	1	2	48	.	48	1	2	51
<i>Echeneis neucratoides</i>	.	.	.	.	4	1	5	.	.	5
<i>Elops saurus</i>	.	2	.	2	368	.	290	80	2	372
<i>Enneacanthus gloriosus</i>	.	.	.	1	.	.	.	.	1	1
<i>Erimyzon sucetta</i>	.	.	.	2	.	.	.	.	2	2
<i>Erotelis smaragdus</i>	.	.	1	.	.	.	1	.	.	1

Appendix AP07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	
	Veg	Unveg	Shore							
	E=63	E=69	E=108	E=155	E=216	E=228	E=301	E=299	E=239		E=839
<i>Esox niger</i>	.	.	.	4	.	.	.	.	4	4
<i>Etheostoma edwini</i>	.	.	.	6	.	.	.	.	6	6
<i>Etheostoma fusiforme</i>	.	.	.	3	.	.	.	.	3	3
<i>Etropus crossotus</i>	.	2	3	.	71	515	389	190	12	591
<i>Etropus cyclosquamus</i>	.	.	.	.	3	55	2	56	.	58
<i>Eucinostomus argenteus</i>	.	.	.	.	.	1	.	1	.	1
<i>Eucinostomus gula</i>	138	12	96	19	60	104	42	361	26	429
<i>Eucinostomus harengulus</i>	9	16	131	105	10	53	80	98	146	324
<i>Eucinostomus</i> spp.	753	150	1,368	735	.	1,086	677	1,644	1,771	4,092
<i>Farfantepenaeus aztecus</i>	.	2	6	1	15	298	255	40	27	322
<i>Farfantepenaeus duorarum</i>	5	.	2	.	13	186	156	50	.	206
<i>Farfantepenaeus</i> spp.	345	139	413	328	7	1,072	777	289	1,238	2,304
<i>Fundulus chrysotus</i>	.	.	.	28	.	.	.	.	28	28
<i>Fundulus confluentus</i>	.	.	.	7	.	.	.	.	7	7
<i>Fundulus grandis</i>	.	.	21	54	39	.	49	11	54	114
<i>Fundulus similis</i>	.	.	99	.	27	.	14	112	.	126
<i>Gambusia holbrooki</i>	.	.	.	382	.	1	.	.	383	383
<i>Gobionellus oceanicus</i>	.	1	22	1	1	12	26	.	11	37
<i>Gobiosoma bosc</i>	1	6	43	180	.	18	50	2	196	248
<i>Gobiosoma longipala</i>	.	.	.	.	.	17	1	16	.	17
<i>Gobiosoma robustum</i>	9	.	6	.	.	.	5	10	.	15
<i>Gobiosoma</i> spp.	3	3	49	75	.	27	56	5	96	157
<i>Graptemys barbouri</i>	.	.	.	.	.	2	.	.	2	2
<i>Gymnura micrura</i>	.	1	.	.	15	6	7	15	.	22
<i>Haemulon plumierii</i>	2	.	.	.	1	.	.	3	.	3
<i>Halichoeres bivittatus</i>	31	.	1	.	1	.	.	33	.	33
<i>Harengula jaguana</i>	6	70	20	106	1,882	2	1,227	753	106	2,086
<i>Hemicarax amblyrhynchus</i>	.	1	.	.	.	20	8	13	.	21
<i>Heterandria formosa</i>	.	.	.	75	.	.	.	.	75	75
<i>Hippocampus erectus</i>	.	.	.	1	1	39	8	32	1	41
<i>Hypleurochilus multifilis</i>	.	.	.	.	.	1	.	1	.	1
<i>Hyporhamphus meeki</i>	9	25	18	.	20	.	2	70	.	72

Appendix AP07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	
	Veg	Unveg	Shore							
	E=63	E=69	E=108	E=155	E=216	E=228	E=301	E=299	E=239		E=839
<i>Hypsoblennius hentz</i>	5	.	.	.	2	.	1	6	.	7
<i>Ictalurus furcatus</i>	.	.	.	.	.	7	.	.	7	7
<i>Ictalurus punctatus</i>	.	.	.	.	.	55	.	.	55	55
<i>Labidesthes sicculus</i>	.	.	.	81	.	.	.	.	81	81
<i>Lagodon rhomboides</i>	9,531	422	1,470	1,139	16,734	1,687	13,525	16,244	1,214	30,983
<i>Leiostomus xanthurus</i>	325	499	5,162	79	4,322	2,642	8,429	3,251	1,349	13,029
<i>Lepisosteus oculatus</i>	.	.	.	13	.	.	.	.	13	13
<i>Lepisosteus osseus</i>	.	.	.	5	6	6	6	1	10	17
<i>Lepomis auritus</i>	.	.	.	90	.	.	.	.	90	90
<i>Lepomis macrochirus</i>	.	.	.	423	.	6	.	.	429	429
<i>Lepomis microlophus</i>	.	.	.	161	.	24	.	.	185	185
<i>Lepomis punctatus</i>	.	.	.	55	.	.	.	.	55	55
<i>Lepomis</i> spp.	.	.	.	16	.	.	.	.	16	16
<i>Limulus polyphemus</i>	.	.	.	.	.	1	.	1	.	1
<i>Litopenaeus setiferus</i>	2	18	197	180	27	2,089	300	3	2,210	2,513
<i>Lucania goodei</i>	.	.	.	5	.	.	.	.	5	5
<i>Lucania parva</i>	250	.	740	1,299	.	130	214	776	1,429	2,419
<i>Lutjanus griseus</i>	3	3	17	14	17	6	24	17	19	60
<i>Lutjanus jocu</i>	.	.	1	.	.	.	1	.	.	1
<i>Lutjanus synagris</i>	11	2	2	.	16	181	142	69	1	212
<i>Macrochelys temminckii</i>	.	.	.	.	.	1	.	.	1	1
<i>Malaclemys terrapin</i>	.	.	.	.	7	.	7	.	.	7
<i>Membras martinica</i>	67	79	94	.	.	.	154	86	.	240
<i>Menidia</i> spp.	159	201	1,954	2,765	2	2	1,012	1,304	2,767	5,083
<i>Menippe</i> spp.	.	.	.	.	3	52	8	47	.	55
<i>Menticirrhus americanus</i>	.	62	72	.	60	220	287	53	74	414
<i>Menticirrhus littoralis</i>	.	.	4	.	13	.	.	17	.	17
<i>Menticirrhus saxatilis</i>	.	2	14	.	7	2	4	20	1	25
<i>Microgobius gulosus</i>	7	2	14	69	.	4	13	10	73	96
<i>Microgobius thalassinus</i>	.	115	167	2	.	1,369	819	96	738	1,653
<i>Micropogonias undulatus</i>	.	93	424	10	3,451	6,151	5,038	870	4,221	10,129
<i>Micropterus salmoides</i>	.	.	.	577	.	3	.	.	580	580

Appendix AP07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	
	Veg	Unveg	Shore							
	E=63	E=69	E=108	E=155	E=216	E=228	E=301	E=299	E=239		E=839
<i>Minytrema melanops</i>	.	.	.	12	.	.	.	.	12	12
<i>Monacanthus ciliatus</i>	15	.	1	.	10	5	1	30	.	31
<i>Morone saxatilis</i>	.	.	.	.	.	1	.	.	1	1
<i>Mugil cephalus</i>	1	8	3,181	63	1,612	3	3,917	885	66	4,868
<i>Mugil curema</i>	2	20	826	4	537	.	1,068	317	4	1,389
<i>Mycteroperca microlepis</i>	8	.	.	.	126	2	79	57	.	136
<i>Myrophis punctatus</i>	.	.	1	1	.	3	3	.	2	5
<i>Narcine bancroftii</i>	.	.	.	.	1	.	.	1	.	1
<i>Nicholsina usta</i>	7	.	.	.	.	4	6	5	.	11
<i>Notemigonus crysoleucas</i>	.	.	.	87	.	.	.	.	87	87
<i>Notropis maculatus</i>	.	.	.	26	.	.	.	.	26	26
<i>Notropis petersoni</i>	.	.	.	363	.	.	.	.	363	363
<i>Notropis texanus</i>	.	.	.	17	.	4	.	.	21	21
<i>Ogcocephalus cubifrons</i>	.	.	.	.	.	10	4	6	.	10
<i>Oligoplites saurus</i>	6	.	32	15	6	.	29	15	15	59
<i>Opisthonema oglinum</i>	.	.	.	.	5	1	1	5	.	6
<i>Opsanus beta</i>	.	.	.	.	22	10	7	25	.	32
<i>Opsopoeodus emiliae</i>	.	.	.	20	.	.	.	.	20	20
<i>Orthopristis chrysoptera</i>	1,125	84	69	19	771	769	593	2,209	35	2,837
<i>Paralichthys albigutta</i>	8	6	12	.	141	57	89	135	.	224
<i>Paralichthys lethostigma</i>	.	1	.	1	15	19	14	4	18	36
<i>Paralichthys spp.</i>	1	2	1	.	.	2	.	6	.	6
<i>Paralichthys squamilentus</i>	.	.	.	.	9	.	8	1	.	9
<i>Penaeidae sp.</i>	.	1	.	.	.	.	.	1	.	1
<i>Peprilus burti</i>	1	.	.	.	9	13	18	5	.	23
<i>Peprilus paru</i>	.	.	.	.	37	36	56	17	.	73
<i>Percina nigrofasciata</i>	.	.	.	1	.	.	.	.	1	1
<i>Platybelone argalus</i>	.	.	.	.	2	.	.	2	.	2
<i>Poecilia latipinna</i>	.	.	2	71	.	.	1	1	71	73
<i>Pogonias cromis</i>	.	.	1	.	35	6	32	5	5	42
<i>Pomatomus saltatrix</i>	.	3	.	1	96	1	58	42	1	101
<i>Pomoxis nigromaculatus</i>	.	.	.	2	.	.	.	.	2	2

Appendix AP07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	
	Veg	Unveg	Shore							
	E=63	E=69	E=108	E=155	E=216	E=228	E=301	E=299	E=239		E=839
<i>Porichthys plectrodon</i>	.	.	.	.	.	51	37	1	13	51
<i>Portunus</i> spp.	.	1	.	.	.	140	87	54	.	141
<i>Prionotus longispinosus</i>	.	.	.	.	.	25	23	2	.	25
<i>Prionotus rubio</i>	.	.	.	.	.	9	3	6	.	9
<i>Prionotus scitulus</i>	.	1	2	.	2	272	34	243	.	277
<i>Prionotus tribulus</i>	.	9	28	3	19	140	120	35	44	199
<i>Pseudemys nelsoni</i>	.	.	.	1	.	4	.	.	5	5
<i>Pseudemys suwanniensis</i>	.	.	.	1	.	1	.	.	2	2
<i>Raja eglanteria</i>	.	.	.	.	.	1	.	1	.	1
<i>Rhinoptera bonasus</i>	.	4	1	.	34	2	38	3	.	41
<i>Rhizoprionodon terraenovae</i>	.	.	.	.	1	1	1	1	.	2
<i>Rimapenaeus constrictus</i>	.	3	4	1	.	703	373	99	239	711
<i>Sardinella aurita</i>	3	.	1	.	.	.	.	4	.	4
<i>Sciaenops ocellatus</i>	3	1	26	6	505	8	241	294	14	549
<i>Scomberomorus maculatus</i>	1	.	.	.	24	.	7	18	.	25
<i>Scorpaena brasiliensis</i>	.	.	.	.	.	1	1	.	.	1
<i>Selene setapinnis</i>	.	.	.	.	1	1	2	.	.	2
<i>Selene vomer</i>	.	.	.	.	13	11	9	15	.	24
<i>Serraniculus pumilio</i>	4	1	.	.	.	12	3	14	.	17
<i>Serranus subligarius</i>	1	.	.	.	.	4	.	5	.	5
<i>Sicyonia dorsalis</i>	.	.	.	.	.	2	1	1	.	2
<i>Sicyonia laevigata</i>	.	.	.	.	.	2	.	2	.	2
<i>Sphoeroides nephelus</i>	2	.	9	.	2	6	3	16	.	19
<i>Sphoeroides</i> spp.	4	5	17	.	.	.	12	14	.	26
<i>Sphyraena borealis</i>	15	.	.	.	.	2	.	17	.	17
<i>Sphyraena guachancho</i>	.	.	.	.	2	.	.	2	.	2
<i>Sphyrna tiburo</i>	.	.	.	.	4	.	1	3	.	4
<i>Stellifer lanceolatus</i>	.	.	.	.	.	2	2	.	.	2
<i>Stenotomus caprinus</i>	.	.	.	.	.	7	.	7	.	7
<i>Stephanolepis hispidus</i>	105	5	1	.	31	69	28	183	.	211
<i>Stomolophus meleagris</i>	.	2	1	.	42	97	37	104	1	142
<i>Strongylura marina</i>	6	3	10	1	156	.	57	118	1	176

Appendix AP07-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	
	Veg	Unveg	Shore							
	E=63	E=69	E=108	E=155	E=216	E=228	E=301	E=299	E=239		E=839
<i>Strongylura notata</i>	.	.	.	.	1	.	.	1	.	1
<i>Strongylura</i> spp.	.	.	5	9	.	.	4	1	9	14
<i>Symphurus plagiusa</i>	7	48	149	23	2	390	254	41	324	619
<i>Syngnathus floridae</i>	67	1	3	.	.	2	3	70	.	73
<i>Syngnathus louisianae</i>	15	2	9	2	.	56	42	37	5	84
<i>Syngnathus scovelli</i>	81	1	5	29	.	9	30	58	37	125
<i>Synodus foetens</i>	16	39	35	14	53	247	105	231	68	404
<i>Trachinotus carolinus</i>	.	.	2	.	58	.	.	60	.	60
<i>Trachinotus falcatus</i>	.	.	6	.	4	.	4	6	.	10
<i>Trichiurus lepturus</i>	.	.	.	.	1	5	5	1	.	6
<i>Trinectes maculatus</i>	.	10	80	1,480	61	762	150	89	2,154	2,393
<i>Tylosurus crocodilus</i>	.	.	.	.	2	.	.	2	.	2
<i>Urophycis floridana</i>	3	2	1	.	.	28	19	15	.	34
<i>Urophycis regia</i>	.	.	.	.	.	1	1	.	.	1
<i>Xiphopenaeus kroyeri</i>	.	.	.	.	.	5	.	.	5	5
Totals	14,599	8,065	29,252	17,550	45,091	76,938	78,833	38,323	74,339	191,495

Intentionally Left Blank

Southern Indian River Lagoon

The sampling area identified as the southern Indian River Lagoon (IRL) system is a narrow estuary located along the eastern central coast of Florida which extends from Vero Beach south to the Jupiter Inlet. The southern IRL is connected to the Atlantic Ocean by three inlets (Ft. Pierce, St. Lucie, and Jupiter). Freshwater inflow comes primarily from the St. Lucie and Loxahatchee Rivers. In addition, there is freshwater input from numerous creeks and canals along the western shoreline. Shoreline vegetation consists largely of fringing mangrove, Brazilian pepper, and marsh grasses. Bottom substrates are typically characterized as sand or mud mixed with shell hash and oysters. Seagrasses, primarily *Halodule wrightii*, are the dominant vegetative cover in the southern IRL (Sime 2005).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the southern IRL since 1997. The area sampled was divided into two geographically-defined bay zones (I and J) and one riverine zone (T; Figure TQ07-01). Monthly stratified-random sampling (SRS) was conducted in all zones using the 183-m haul seine. All sampling methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in the southern IRL.

Stratified-Random Sampling

183-m Haul Seines. A total of 22,112 fishes (98 taxa) and selected invertebrates (three taxa) were collected from 192 southern IRL samples in 2007 (Table TQ07-01, Appendices TQ07-01 and -02). *Lagodon rhomboides* (n=5,263) and *Diapterus auratus* (n=5,131) were the most numerous taxa collected, representing 47.0% of the 183-m haul seine catch (Table TQ07-02). *Eucinostomus gula* (n=1,103) was the next most abundant taxa collected, accounting for an additional 5.0% of the 183-m haul seine catch. The taxa most frequently collected in the 183-m haul seine were *D. auratus* (78.6% occurrence), *Archosargus probatocephalus* (76.6% occurrence), and *Mugil cephalus* (67.2% occurrence). New taxa collected from the southern IRL included

Anchoa spp.(anchovy), *Etropus crossotus* (fringed flounder), and *Ogcocephalus nasutus* (shortnose batfish).

A total of 4,990 animals from 30 Selected Taxa were collected, representing 22.6% of the entire 183-m haul seine catch (Table TQ07-03). *Mugil curema* (n=972), *A. probatocephalus* (n=852), and *M. cephalus* (n=767) were the most abundant Selected Taxa, accounting for 51.9% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught were *A. probatocephalus* (76.6% occurrence) and *M. cephalus* (67.2% occurrence).

References

Sime, P. 2005. St. Lucie Estuary and Indian River Lagoon conceptual ecological model. *Wetlands* 25(4):898-907.

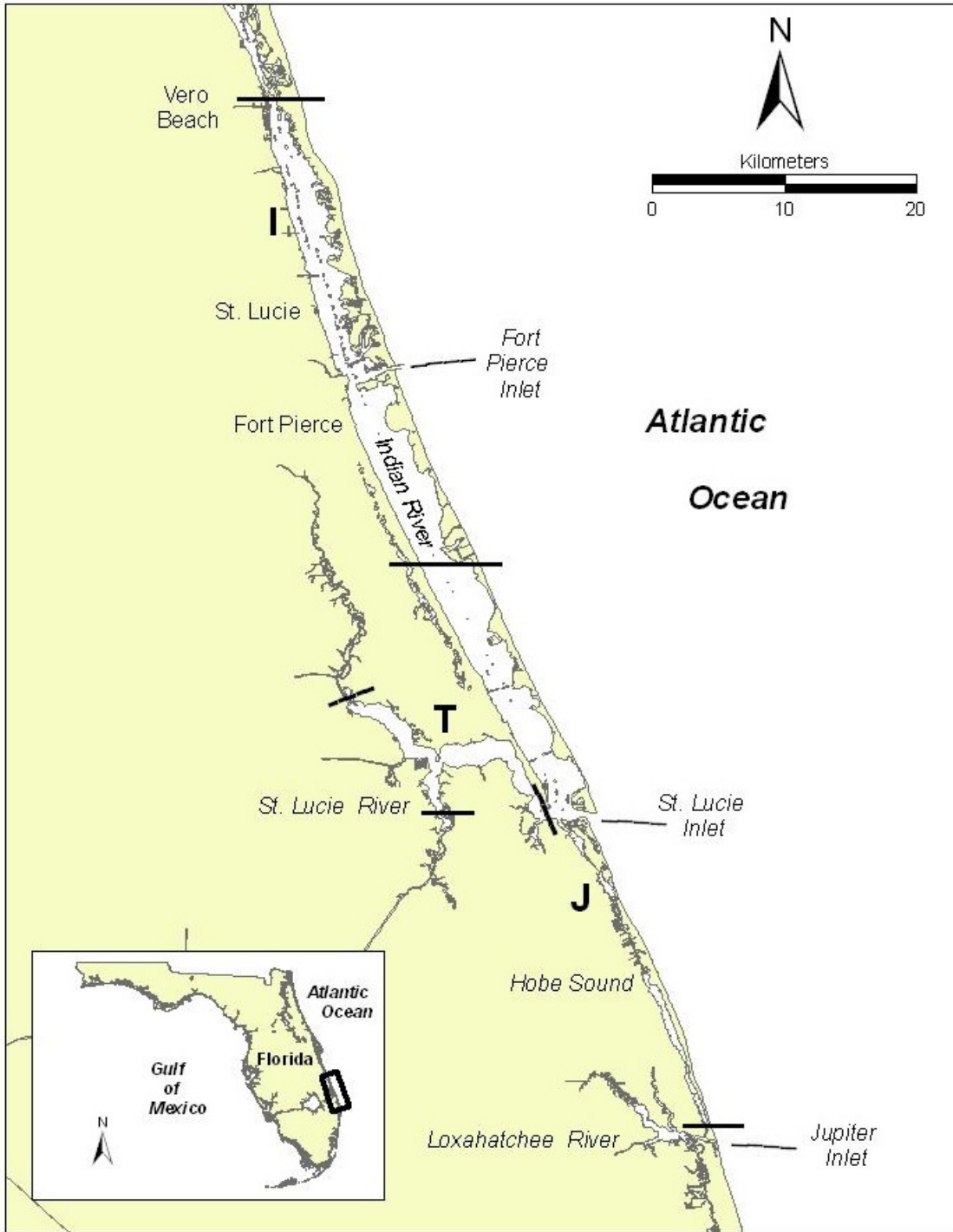


Figure TQ07-01. Map of southern Indian River Lagoon sampling area, separated into stratified three geographic zones; I, J, and T.

Table TQ07-01. Summary of catch and effort data for Southern Indian River Lagoon stratified-random sampling, 2007.

Zone	Totals	
	Animals	Hauls
I	8,677	48
J	7,798	48
T	5,637	96
Totals	22,112	192

Table TQ07-02. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Southern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Lagodon rhomboides</i>	5,263	23.8	39.1	27.41	4.96	250.57	387.00	119	0.38	58	200
<i>Diapterus auratus</i>	5,131	23.2	78.6	26.72	3.65	189.14	466.00	142	0.60	47	490
<i>Eucinostomus gula</i>	1,103	5.0	42.2	5.74	1.02	244.88	84.00	78	0.30	40	135
<i>Mugil curema</i>	972	4.4	60.9	5.06	0.78	213.82	71.00	199	1.47	78	354
<i>Selene vomer</i>	962	4.4	51.6	5.01	0.89	247.16	106.00	162	0.95	44	295
<i>Archosargus probatocephalus</i>	852	3.9	76.6	4.44	0.66	207.45	110.00	213	3.37	38	412
<i>Mugil cephalus</i>	767	3.5	67.2	3.99	0.54	186.21	52.00	291	2.20	100	428
<i>Orthopristis chrysoptera</i>	743	3.4	16.7	3.87	0.93	332.66	85.00	102	0.91	46	192
<i>Centropomus undecimalis</i>	565	2.6	59.9	2.94	0.38	178.95	41.00	426	6.44	167	910
<i>Elops saurus</i>	543	2.5	37.0	2.83	0.90	441.63	147.00	388	5.08	131	623
Subtotal	16,901	76.7	.	.	.	.	.	.	.	38	910
Totals	22,112	100.0	.	115.16	9.11	109.60	684.00	.	.	33	910

Table TQ07-03. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Southern Indian River Lagoon stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Mugil curema</i>	972	4.4	60.9	5.06	0.78	213.82	71.00	199	1.47	78	354
<i>Archosargus probatocephalus</i>	852	3.9	76.6	4.44	0.66	207.45	110.00	213	3.37	38	412
<i>Mugil cephalus</i>	767	3.5	67.2	3.99	0.54	186.21	52.00	291	2.20	100	428
<i>Centropomus undecimalis</i>	565	2.6	59.9	2.94	0.38	178.95	41.00	426	6.44	167	910
<i>Elops saurus</i>	543	2.5	37.0	2.83	0.90	441.63	147.00	388	5.08	131	623
<i>Micropogonias undulatus</i>	289	1.3	26.6	1.51	0.31	286.50	37.00	236	3.29	97	377
<i>Lutjanus analis</i>	262	1.2	22.9	1.36	0.31	314.44	43.00	121	2.04	65	229
<i>Callinectes sapidus</i>	181	0.8	24.5	0.94	0.23	340.71	35.00	122	2.73	45	191
<i>Lutjanus griseus</i>	166	0.8	25.0	0.86	0.20	315.42	22.00	158	3.49	75	282
<i>Pogonias cromis</i>	131	0.6	21.4	0.68	0.17	345.54	20.00	239	4.00	122	411
<i>Lutjanus synagris</i>	68	0.3	10.4	0.35	0.13	499.57	18.00	95	2.33	60	148
<i>Menticirrhus americanus</i>	30	0.1	7.3	0.16	0.05	437.64	5.00	224	10.86	132	353
<i>Sciaenops ocellatus</i>	28	0.1	11.5	0.15	0.03	297.35	2.00	308	28.44	68	595
<i>Paralichthys albigutta</i>	27	0.1	8.3	0.14	0.04	434.18	6.00	193	13.35	82	337
<i>Cynoscion nebulosus</i>	14	0.1	6.3	0.07	0.02	408.90	2.00	239	40.51	73	517
<i>Mycteroperca microlepis</i>	11	0.0	3.1	0.06	0.03	672.70	4.00	134	5.22	108	160
<i>Trachinotus falcatus</i>	10	0.0	3.1	0.05	0.02	613.15	3.00	93	10.81	47	150

Table TQ07-03. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	10	0.0	3.1	0.05	0.02	613.15	3.00	139	18.32	79	221
<i>Epinephelus itajara</i>	10	0.0	3.1	0.05	0.03	673.17	4.00	200	19.89	121	280
<i>Scomberomorus maculatus</i>	9	0.0	4.2	0.05	0.02	502.05	2.00	324	38.13	150	531
<i>Paralichthys lethostigma</i>	7	0.0	3.6	0.04	0.01	515.43	1.00	309	24.65	244	404
<i>Epinephelus morio</i>	7	0.0	1.0	0.04	0.03	1,203.05	6.00	103	4.73	89	125
<i>Scomberomorus regalis</i>	6	0.0	2.6	0.03	0.01	647.18	2.00	247	26.86	125	295
<i>Albula vulpes</i>	6	0.0	2.1	0.03	0.02	725.31	2.00	190	8.70	152	207
<i>Mycteroperca bonaci</i>	6	0.0	2.1	0.03	0.02	795.80	3.00	128	2.58	116	135
<i>Pomatomus saltatrix</i>	5	0.0	2.1	0.03	0.01	728.26	2.00	283	73.11	102	440
<i>Trachinotus carolinus</i>	3	0.0	1.6	0.02	0.01	795.80	1.00	313	34.72	245	360
<i>Cynoscion arenarius</i>	3	0.0	0.5	0.02	0.02	1,385.64	3.00	290	14.71	273	319
<i>Farfantepenaeus duorarum</i>	1	0.0	0.5	0.01	0.01	1,385.64	1.00	55	.	55	55
<i>Megalops atlanticus</i>	1	0.0	0.5	0.01	0.01	1,385.64	1.00	285	.	285	285
Totals	4,990	22.6	99.5	25.99	1.96	104.64	185.00	.	.	38	910

Appendix TQ07-01. Monthly summary of species collected during Southern Indian River Lagoon stratified-random sampling, 2007. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals E=192
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	
<i>Acanthostracion quadricornis</i>	.	.	1	.	2	.	.	.	.	.	.	.	3
<i>Aetobatus narinari</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Albula vulpes</i>	.	.	.	4	.	.	.	.	.	2	.	.	6
<i>Anchoa</i> sp.	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Anguilla rostrata</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Anisotremus virginicus</i>	.	.	.	.	.	.	.	.	3	.	.	.	3
<i>Archosargus probatocephalus</i>	50	37	90	37	42	89	95	220	48	49	40	55	852
<i>Archosargus rhomboidalis</i>	18	1	35	15	13	8	2	32	67	59	58	6	314
<i>Ariopsis felis</i>	11	21	24	21	39	58	76	31	16	26	26	15	364
<i>Bagre marinus</i>	1	.	.	.	16	8	7	.	.	.	2	.	34
<i>Bairdiella chrysoura</i>	19	4	1	8	.	3	1	18	.	13	86	3	156
<i>Brevoortia</i> spp.	.	.	.	2	.	22	1	2	.	.	.	.	27
<i>Calamus arctifrons</i>	.	.	.	.	1	.	.	3	.	1	.	.	5
<i>Callinectes sapidus</i>	18	41	12	4	31	18	7	27	8	4	9	2	181
<i>Callinectes similis</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Caranx bartholomaei</i>	.	.	.	.	.	.	.	5	.	3	.	.	8
<i>Caranx crysos</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Caranx hippos</i>	25	14	13	15	18	9	7	7	2	13	14	24	161
<i>Caranx latus</i>	.	5	.	.	20	.	.	.	1	3	9	1	39
<i>Centropomus parallelus</i>	1	.	.	.	.	.	.	.	.	.	.	1	2
<i>Centropomus undecimalis</i>	97	37	33	76	59	40	25	60	13	44	20	61	565
<i>Chaetodipterus faber</i>	.	1	.	.	.	.	1	19	2	2	1	.	26
<i>Chelonia mydas</i>	.	.	.	.	.	.	.	.	1	1	.	2	4

Appendix TQ07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16		E=192
<i>Chilomycterus schoepfii</i>	9	17	5	11	13	18	6	21	13	19	11	13	156
<i>Chloroscombrus chrysurus</i>	.	.	.	.	.	.	.	.	.	1	1	.	2
<i>Citharichthys spilopterus</i>	2	1	4	5	1	2	3	27	16	1	.	2	64
<i>Cynoscion arenarius</i>	.	.	.	3	.	.	.	.	.	.	.	.	3
<i>Cynoscion nebulosus</i>	3	1	1	.	.	1	.	3	1	.	2	2	14
<i>Dasyatis sabina</i>	16	29	21	12	22	76	12	61	45	15	22	33	364
<i>Dasyatis say</i>	4	1	2	5	4	11	2	2	2	.	2	4	39
<i>Diapterus auratus</i>	349	361	233	457	622	417	729	484	350	224	294	611	5,131
<i>Diodon hystrix</i>	.	.	.	.	.	1	.	3	.	.	.	.	4
<i>Diplodus holbrookii</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Elops saurus</i>	113	62	36	45	20	11	13	2	3	17	64	157	543
<i>Epinephelus itajara</i>	.	.	2	.	.	.	5	.	.	3	.	.	10
<i>Epinephelus morio</i>	.	.	.	.	.	.	.	7	.	.	.	.	7
<i>Etropus crossotus</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Eucinostomus argenteus</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Eucinostomus gula</i>	40	47	217	179	51	120	138	200	36	31	35	9	1,103
<i>Eucinostomus harengulus</i>	220	127	28	18	27	69	19	23	4	.	.	.	535
<i>Eucinostomus jonesii</i>	.	.	4	.	.	11	9	.	.	.	.	.	24
<i>Eucinostomus melanopterus</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Eucinostomus spp.</i>	1	.	1	1	2	.	.	.	.	.	.	.	5
<i>Eugerres plumieri</i>	3	.	3	1	6	2	11	6	3	4	1	1	41
<i>Farfantepenaeus duorarum</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Gerres cinereus</i>	29	2	13	20	.	10	4	2	2	3	4	8	97
<i>Gymnura micrura</i>	.	1	.	2	.	.	.	.	3	.	.	1	7

Appendix TQ07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16		E=192
<i>Haemulon aurolineatum</i>	.	1	2	.	2	.	3	9	18	7	.	.	42
<i>Haemulon parra</i>	.	1	1	.	.	.	.	1	6	20	16	.	45
<i>Haemulon plumierii</i>	.	.	17	.	3	.	.	9	.	.	.	.	29
<i>Haemulon sciurus</i>	.	1	.	.	9	.	.	4	2	.	.	.	16
<i>Harengula jaguana</i>	11	3	37	7	.	1	.	44	6	.	7	4	120
<i>Hemiramphus brasiliensis</i>	.	21	.	2	.	.	.	1	3	1	.	.	28
<i>Hippocampus erectus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Lachnolaimus maximus</i>	.	.	4	.	12	.	.	9	.	.	.	.	25
<i>Lactophrys trigonus</i>	4	.	.	1	8	.	1	3	.	2	1	.	20
<i>Lagodon rhomboides</i>	314	228	79	454	228	416	801	1,277	584	349	465	68	5,263
<i>Leiostomus xanthurus</i>	1	.	.	.	3	2	.	1	.	.	3	.	10
<i>Lepisosteus osseus</i>	.	.	.	.	.	.	1	.	.	1	.	.	2
<i>Lutjanus analis</i>	4	11	2	1	29	4	16	68	24	71	29	3	262
<i>Lutjanus griseus</i>	3	25	4	2	19	15	10	56	14	12	4	2	166
<i>Lutjanus synagris</i>	.	4	7	3	3	1	2	22	20	5	1	.	68
<i>Megalops atlanticus</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Menticirrhus americanus</i>	7	4	1	5	3	.	7	.	.	2	1	.	30
<i>Micropogonias undulatus</i>	16	15	8	15	35	9	62	52	10	34	32	1	289
<i>Monacanthus ciliatus</i>	.	.	3	.	.	.	.	.	.	.	.	.	3
<i>Mugil cephalus</i>	147	87	65	45	26	83	13	44	11	55	50	141	767
<i>Mugil curema</i>	158	161	111	58	63	41	18	22	27	68	105	140	972
<i>Mycteroperca bonaci</i>	.	.	.	.	.	.	1	4	1	.	.	.	6
<i>Mycteroperca microlepis</i>	.	.	.	.	.	.	2	3	5	1	.	.	11
<i>Nicholsina usta</i>	.	.	26	.	1	.	.	21	.	.	.	.	48
<i>Ocyurus chrysurus</i>	.	.	.	.	.	.	.	4	.	.	.	.	4
<i>Ogcocephalus nasutus</i>	1	.	.	.	.	.	.	.	.	.	.	.	1

Appendix TQ07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16		E=192
<i>Oligoplites saurus</i>	10	10	2	5	3	.	1	6	5	11	5	5	63
<i>Opisthonema oglinum</i>	14	.	2	6	.	3	20	134	.	.	1	1	181
<i>Opsanus tau</i>	.	1	.	.	1	1	2	.	.	1	1	.	7
<i>Orthopristis chrysoptera</i>	2	.	.	1	28	89	164	259	58	65	77	.	743
<i>Paralichthys albigutta</i>	9	.	.	.	4	3	1	1	1	1	2	5	27
<i>Paralichthys lethostigma</i>	.	.	1	.	1	1	.	1	1	1	1	.	7
<i>Paralichthys sp.</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Pogonias cromis</i>	4	9	1	8	50	5	14	9	8	7	10	6	131
<i>Pomatomus saltatrix</i>	.	.	.	1	.	1	1	.	.	.	.	2	5
<i>Prionotus tribulus</i>	1	1	.	4	.	2	.	.	.	1	.	.	9
<i>Sciaenops ocellatus</i>	4	4	2	4	1	3	.	2	2	2	1	3	28
<i>Scomberomorus maculatus</i>	.	1	2	.	.	.	.	1	1	.	3	1	9
<i>Scomberomorus regalis</i>	1	.	.	.	1	.	1	.	2	1	.	.	6
<i>Scorpaena grandicornis</i>	.	.	.	.	.	.	.	7	4	.	4	.	15
<i>Scorpaena plumieri</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Selene vomer</i>	138	48	12	44	223	74	32	24	70	132	133	32	962
<i>Sparisoma chrysopterygum</i>	.	.	5	.	.	.	.	.	.	.	.	.	5
<i>Sparisoma radians</i>	.	.	.	.	.	.	.	2	.	.	.	.	2
<i>Sparisoma rubripinne</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Sphoeroides nephelus</i>	9	10	11	5	8	11	6	15	8	4	8	5	100
<i>Sphoeroides spengleri</i>	5	.	1	.	1	.	.	.	3	3	1	.	14
<i>Sphoeroides testudineus</i>	11	11	13	12	43	15	48	37	55	38	38	35	356
<i>Sphyraena barracuda</i>	10	7	15	4	6	3	1	10	11	13	29	20	129
<i>Sphyrna tiburo</i>	.	.	.	.	.	.	.	1	.	.	5	.	6
<i>Stephanolepis hispidus</i>	.	2	3	.	3	1	4	2	1	.	.	.	16
<i>Strongylura marina</i>	1	.	2	4	.	2	.	.	.	4	.	.	13

Appendix TQ07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=192
<i>Strongylura notata</i>	2	16	8	10	1	.	2	5	7	9	9	1	70
<i>Symphurus plagiusa</i>	1	.	.	5	.	.	.	.	.	.	.	.	6
<i>Synodus foetens</i>	1	3	2	1	.	.	.	.	1	2	2	.	12
<i>Trachinotus carolinus</i>	.	1	.	2	.	.	.	.	.	.	.	.	3
<i>Trachinotus falcatus</i>	5	.	.	.	.	.	2	2	.	.	1	.	10
<i>Trinectes maculatus</i>	3	6	1	2	.	.	1	11	.	2	10	.	36
Totals	1,926	1,505	1,229	1,655	1,827	1,791	2,411	3,452	1,608	1,465	1,757	1,486	22,112

Appendix TQ07-02. Summary by gear, stratum, and zone of species collected during Southern Indian River Lagoon stratified-random sampling, 2007. Sampling with 183-m haul seine was post-stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Zones I and J were located in the Indian River, and Zone T encompassed the lower St. Lucie River. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata		Zone			Totals
	183-m haul seine		I	J	T	
	Over	Nonover				
	E=129	E=63	E=48	E=48	E=96		E=192
<i>Acanthostracion quadricornis</i>	2	1	.	2	1	3
<i>Aetobatus narinari</i>	1	.	1	.	.	1
<i>Albula vulpes</i>	5	1	2	4	.	6
<i>Anchoa</i> sp.	1	.	.	.	1	1
<i>Anguilla rostrata</i>	1	.	.	.	1	1
<i>Anisotremus virginicus</i>	3	.	3	.	.	3
<i>Archosargus probatocephalus</i>	642	210	378	231	243	852
<i>Archosargus rhomboidalis</i>	291	23	114	200	.	314
<i>Ariopsis felis</i>	309	55	144	81	139	364
<i>Bagre marinus</i>	34	.	8	8	18	34
<i>Bairdiella chrysoura</i>	140	16	126	29	1	156
<i>Brevoortia</i> spp.	24	3	1	3	23	27
<i>Calamus arctifrons</i>	5	.	1	4	.	5
<i>Callinectes sapidus</i>	131	50	19	10	152	181
<i>Callinectes similis</i>	1	.	.	.	1	1
<i>Caranx bartholomaei</i>	8	.	.	8	.	8
<i>Caranx crysos</i>	1	.	1	.	.	1
<i>Caranx hippos</i>	125	36	46	59	56	161
<i>Caranx latus</i>	39	.	1	10	28	39
<i>Centropomus parallelus</i>	1	1	.	.	2	2
<i>Centropomus undecimalis</i>	446	119	242	157	166	565
<i>Chaetodipterus faber</i>	22	4	20	3	3	26
<i>Chelonia mydas</i>	4	.	1	1	2	4
<i>Chilomycterus schoepfii</i>	99	57	41	95	20	156
<i>Chloroscombrus chrysurus</i>	2	.	2	.	.	2
<i>Citharichthys spilopterus</i>	34	30	7	3	54	64
<i>Cynoscion arenarius</i>	3	.	.	.	3	3
<i>Cynoscion nebulosus</i>	12	2	7	4	3	14

Appendix TQ07-02. (Continued)

Species	Gear and Strata		Zone			Totals
	183-m haul seine		I	J	T	
	Over	Nonover				
	E=129	E=63	E=48	E=48	E=96	E=192
<i>Dasyatis sabina</i>	292	72	75	70	219	364
<i>Dasyatis say</i>	31	8	14	21	4	39
<i>Diapterus auratus</i>	3,964	1,167	1,016	2,149	1,966	5,131
<i>Diodon hystrix</i>	1	3	.	3	1	4
<i>Diplodus holbrookii</i>	1	.	.	1	.	1
<i>Elops saurus</i>	504	39	99	317	127	543
<i>Epinephelus itajara</i>	7	3	6	4	.	10
<i>Epinephelus morio</i>	6	1	.	7	.	7
<i>Etropus crossotus</i>	.	1	.	.	1	1
<i>Eucinostomus argenteus</i>	1	.	.	.	1	1
<i>Eucinostomus gula</i>	727	376	552	297	254	1,103
<i>Eucinostomus harengulus</i>	272	263	97	29	409	535
<i>Eucinostomus jonesii</i>	15	9	.	16	8	24
<i>Eucinostomus melanopterus</i>	1	.	.	1	.	1
<i>Eucinostomus spp.</i>	4	1	2	2	1	5
<i>Eugerres plumieri</i>	31	10	6	15	20	41
<i>Farfantepenaeus duorarum</i>	1	.	.	.	1	1
<i>Gerres cinereus</i>	93	4	25	69	3	97
<i>Gymnura micrura</i>	3	4	.	.	7	7
<i>Haemulon aurolineatum</i>	33	9	20	22	.	42
<i>Haemulon parra</i>	44	1	7	37	1	45
<i>Haemulon plumierii</i>	24	5	.	29	.	29
<i>Haemulon sciurus</i>	3	13	.	16	.	16
<i>Harengula jaguana</i>	76	44	34	43	43	120
<i>Hemiramphus brasiliensis</i>	5	23	24	4	.	28
<i>Hippocampus erectus</i>	1	.	.	.	1	1
<i>Lachnolaimus maximus</i>	10	15	1	24	.	25
<i>Lactophrys trigonus</i>	8	12	6	13	1	20
<i>Lagodon rhomboides</i>	3,838	1,425	3,550	1,711	2	5,263
<i>Leiostomus xanthurus</i>	6	4	7	3	.	10
<i>Lepisosteus osseus</i>	1	1	.	.	2	2
<i>Lutjanus analis</i>	215	47	101	159	2	262

Appendix TQ07-02. (Continued)

Species	Gear and Strata		Zone			Totals
	183-m haul seine		I	J	T	
	Over	Nonover				E=48
	E=129	E=63	E=48	E=48	E=96	E=192
<i>Lutjanus griseus</i>	115	51	69	84	13	166
<i>Lutjanus synagris</i>	65	3	25	38	5	68
<i>Megalops atlanticus</i>	1	.	.	.	1	1
<i>Menticirrhus americanus</i>	29	1	1	1	28	30
<i>Micropogonias undulatus</i>	195	94	6	22	261	289
<i>Monacanthus ciliatus</i>	3	.	.	3	.	3
<i>Mugil cephalus</i>	505	262	160	285	322	767
<i>Mugil curema</i>	636	336	256	289	427	972
<i>Mycteroperca bonaci</i>	6	.	5	1	.	6
<i>Mycteroperca microlepis</i>	9	2	6	5	.	11
<i>Nicholsina usta</i>	31	17	1	47	.	48
<i>Ocyurus chrysurus</i>	4	.	.	4	.	4
<i>Ogcocephalus nasutus</i>	1	.	.	1	.	1
<i>Oligoplites saurus</i>	53	10	8	49	6	63
<i>Opisthonema oglinum</i>	178	3	132	6	43	181
<i>Opsanus tau</i>	5	2	5	2	.	7
<i>Orthopristis chrysoptera</i>	587	156	468	274	1	743
<i>Paralichthys albigutta</i>	14	13	20	4	3	27
<i>Paralichthys lethostigma</i>	6	1	4	1	2	7
<i>Paralichthys sp.</i>	1	.	.	.	1	1
<i>Pogonias cromis</i>	85	46	44	64	23	131
<i>Pomatomus saltatrix</i>	4	1	1	3	1	5
<i>Prionotus tribulus</i>	8	1	1	.	8	9
<i>Sciaenops ocellatus</i>	16	12	15	9	4	28
<i>Scomberomorus maculatus</i>	6	3	2	3	4	9
<i>Scomberomorus regalis</i>	6	.	2	3	1	6
<i>Scorpaena grandicomis</i>	15	.	4	10	1	15
<i>Scorpaena plumieri</i>	1	.	1	.	.	1
<i>Selene vomer</i>	819	143	318	340	304	962
<i>Sparisoma chrysopteron</i>	5	.	.	5	.	5
<i>Sparisoma radians</i>	2	.	.	2	.	2
<i>Sparisoma rubripinne</i>	.	1	.	1	.	1

Appendix TQ07-02. (Continued)

Species	Gear and Strata		Zone			Totals
	183-m haul seine		I	J	T	
	Over	Nonover				
	E=129	E=63	E=48	E=48	E=96		E=192
<i>Sphoeroides nephelus</i>	76	24	76	19	5	100
<i>Sphoeroides spengleri</i>	13	1	3	10	1	14
<i>Sphoeroides testudineus</i>	240	116	97	133	126	356
<i>Sphyraena barracuda</i>	108	21	50	75	4	129
<i>Sphyrna tiburo</i>	6	.	6	.	.	6
<i>Stephanolepis hispidus</i>	11	5	6	9	1	16
<i>Strongylura marina</i>	9	4	9	.	4	13
<i>Strongylura notata</i>	58	12	56	12	2	70
<i>Symphurus plagiusa</i>	4	2	.	.	6	6
<i>Synodus foetens</i>	8	4	2	5	5	12
<i>Trachinotus carolinus</i>	2	1	1	.	2	3
<i>Trachinotus falcatus</i>	3	7	1	4	5	10
<i>Trinectes maculatus</i>	24	12	9	1	26	36
Totals	16,577	5,535	8,677	7,798	5,637	22,112

Intentionally Left Blank

Florida Keys

The Florida Keys coastal ecosystem is characterized by mangroves at the coastal interface and a mix of bare substrate, seagrass, hardbottom, and coral reef habitats off the coast (Wheaton et al. 2001). The Florida reef tract, associated with the Florida Keys, is oriented south and then west from the tip of the Florida peninsula (Jaap 1984). The majority of coral reefs are located on the ocean side of the Keys, while hardbottom habitat exists on the ocean side and in Florida Bay.

The Fisheries-Independent Monitoring (FIM) program has conducted visual surveys of reef fish in the Florida Keys since 1999. The visual survey was designed to sample recreationally and commercially important reef fish species primarily from the snapper/grouper complex (Table FK07-01). The area sampled was divided into four geographically-defined zones (A – D) which are often grouped into the regions referred to as upper, middle, and lower Keys (Acosta et al. 2007). The Keys regions correspond to the FIM sampling zones as follows: upper (Zones A and B), middle (Zone C), and lower Keys (Zone D; Figure FK07-01). All areas within each zone that contained patch or continuous reef habitat were included in the visual survey sampling universe. Monthly stratified-random visual surveys (5-m radius circular point counts) were conducted on the reef from April through October. All sampling methods were the same as described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in the Florida Keys.

Stratified-Random Sampling

A total of 34,511 animals (55 Selected Reef Taxa) were recorded during 1,004 5-m radius point count surveys in 2007 (Tables FK07-02, -03; Appendices FK07-01 and -02). Haemulids (n=24,940) were the most numerous taxa recorded representing 72.3% of all individuals recorded (Table FK07-03). Of these taxa, *Haemulon plumierii* (n=6,988), *H. aurolineatum*, (n=6,536), *H. flavolineatum* (n=2,846) and *H. sciurus* (n=2,228) were most abundant, comprising 74.6% of the total haemulids counted. *Ocyurus chrysurus* (n=3,563), *Lutjanus griseus* (n=1,046), *Lachnolaimus maximus* (n=935), and *Lutjanus apodus* (n=632) were the most abundant non-haemulid species,

accounting for an additional 17.9% of the total species observed and 64.5% of the non-haemulid species observed. The Selected Reef Taxa most frequently recorded were *H. plumierii* (55.4% occurrence), *O. chrysurus* (43.0% occurrence), and *L. maximus* (40.9% occurrence).

Length-frequencies based upon the 1,004 5-m radius point count surveys indicated that this method was effective at collecting data on a wide range of Selected Reef Taxa (Table FK07-04). The most abundant size classes were less than 25 cm and were composed of several haemulid taxa. There were eight taxa in the snapper/grouper complex for which individuals were recorded with sizes above the State of Florida minimum recreational size limit (MSL). The taxa most frequently recorded with sizes above the MSL were *Lutjanus griseus* (37.2% above MSL) and *L. apodus* (30.7% above MSL).

Upper Keys – Zone A. A total of 8,729 animals (40 Selected Reef Taxa) were recorded from 288 5-m random point count surveys (30 animals/count) in the upper Keys - Zone A (Appendix FK07-02). *Haemulon plumierii* (n=2,152) and *H. aurolineatum* (n=1,437) were the most abundant Selected Reef Taxa, comprising 41.1% of the total animals counted in the upper Keys Zone A. *Ocyurus chrysurus* (n=703) was the most abundant non-haemulid taxon, accounting for an additional 8.1% of the total animals counted in this area.

Upper Keys – Zone B. A total of 10,556 animals (44 Selected Reef Taxa) were recorded from 240 5-m random point count surveys (44 animals/count) in the upper Keys - Zone B (Table FK07-02, Appendix FK07-02). *Haemulon aurolineatum*, (n=3,379), *H. plumierii* (n=2,229), and *Haemulon* spp. (n=1,631) were the most abundant Selected Reef Taxa, comprising 68.6% of the total animals counted in the upper Keys Zone B. *Ocyurus chrysurus* (n=476) and *L. maximus* (n=311) were the most abundant non-haemulid taxa, accounting for an additional 7.5% of the total animals counted in this area.

Middle Keys. A total of 6,368 animals (35 Selected Reef Taxa) were recorded from 152 5-m random point count surveys (42 animals/count) in the middle Keys (Zone C; Appendix FK07-02). *Haemulon plumierii* (n=1,276), *O. chrysurus* (n=1,065), and *H. aurolineatum* (n=1,027) were the most abundant Selected Reef Taxa, comprising 52.9%

of the total animals counted in the middle Keys. *Lutjanus griseus* (n=331) and *L. maximus* (n=221) were the most abundant non-haemulid taxa, accounting for an additional 8.7% of the total animals counted in this area.

Lower Keys. A total of 8,858 animals (43 Selected Reef Taxa) were recorded from 324 5-m random point count surveys (27 animals/count) in the lower Keys (Zone D; Appendix FK07-02). *Haemulon* spp. (n=1,524), *H. plumierii* (n=1,331), and *O. chrysurus* (n=1,319) were the most abundant Selected Reef Taxa, comprising 47.1% of the total animals counted in the lower Keys. *Lutjanus griseus* (n=380) was the most abundant non-haemulid taxon, accounting for an additional 4.3% of the total animals counted in this area.

References

Acosta, A., Bartels, C., Colvocoresses, J., Greenwood, M.F.D. 2007. Fish assemblages in seagrass habitats of the Florida Keys, Florida: spatial and temporal characteristics. *Bulletin of Marine Science*: 1-19.

Jaap, W.C. 1984. *The ecology of the South Florida Coral Reefs: A community profile*. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C. FWS/OBS-82/08. 138 pp.

Wheaton, J., W.C. Jaap, J.W. Porter, V. Kosminyn, K. Hackett, M. Lybolt, M.K. Callahan, J. Kidney, S. Kupfner, C. Tsokos, and G. Yanev. 2001. EPA/FKNMS Coral Reef Monitoring Project Executive Summary 2001, FKNMS Symposium: An Ecosystem Report Card, A report of FMRI to UNCW 2001-03-64, NOAA Coastal Ocean Program for the Florida Keys National Marine Sanctuary, Washington DC, December 2001.

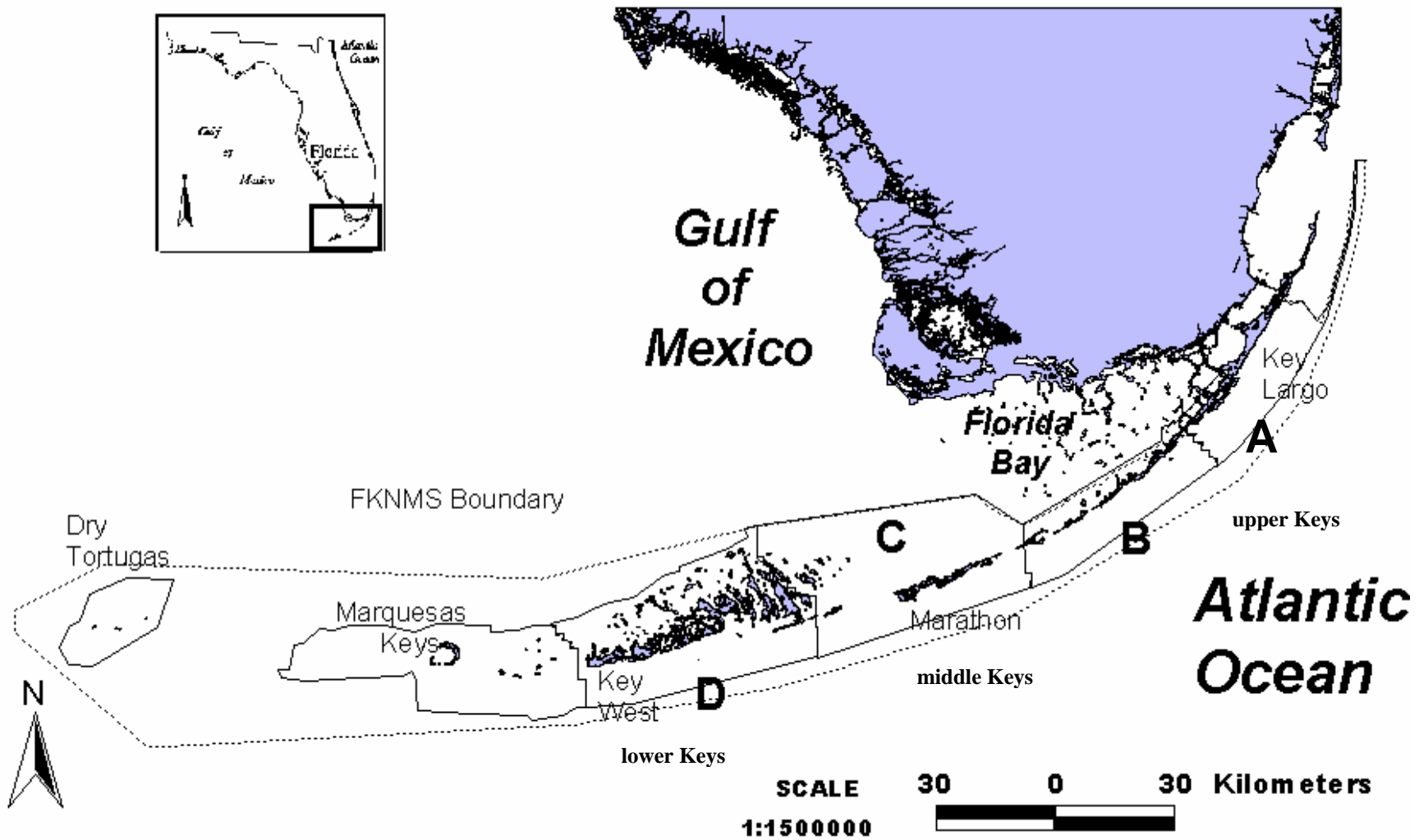


Figure FK07-01. Map of FIM sampling areas in the Florida Keys National Marine Sanctuary. Zones are labeled A - D.

Table FK07-01. Animals designated as Selected Reef Fish Species because of their recreational or commercial importance.

	Scientific Name	Common Name
1	<i>Anisotremus surinamensis</i>	black margate
2	<i>Anisotremus virginicus</i>	porkfish
3	<i>Balistes capriscus</i>	gray triggerfish
4	<i>Balistes vetula</i>	queen triggerfish
5	<i>Bodianus pulchellus</i>	spotfin hogfish
6	<i>Bodianus rufus</i>	Spanish hogfish
7	<i>Canthidermis sufflamen</i>	ocean triggerfish
8	<i>Cephalopholus cruentata</i>	graysby
9	<i>Cephalopholus fulva</i>	coney
10	<i>Chaetodon aculeatus</i>	longsnout butterflyfish
11	<i>Chaetodon capistratus</i>	four-eye butterflyfish
12	<i>Chaetodon ocellatus</i>	spotfin butterflyfish
13	<i>Chaetodon sedentarius</i>	reef butterflyfish
14	<i>Chaetodon striatus</i>	banded butterflyfish
15	<i>Epinephelus adscensionis</i>	rock hind
16	<i>Epinephelus guttatus</i>	red hind
17	<i>Epinephelus itajara</i>	goliath grouper
18	<i>Epinephelus morio</i>	red grouper
19	<i>Epinephelus striatus</i>	Nassau grouper
20	<i>Haemulon album</i>	margate
21	<i>Haemulon aurolineatum</i>	tomtate
22	<i>Haemulon carbonarium</i>	caesar grunt
23	<i>Haemulon chrysargyreum</i>	smallmouth grunt
24	<i>Haemulon flavolineatum</i>	French grunt
25	<i>Haemulon macrostomum</i>	Spanish grunt
26	<i>Haemulon melanurum</i>	cottonwick
27	<i>Haemulon parra</i>	sailors choice
28	<i>Haemulon plumierii</i>	white grunt
29	<i>Haemulon sciurus</i>	bluestriped grunt
30	<i>Haemulon striatum</i>	striped grunt
31	<i>Heteropriacanthus cruentatus</i>	glasseye snapper
32	<i>Holacanthus bermudensis</i>	blue angelfish
33	<i>Holacanthus ciliaris</i>	queen angelfish
34	<i>Holacanthus tricolor</i>	rock beauty
35	<i>Lachnolaimus maximus</i>	hogfish
36	<i>Lutjanus analis</i>	mutton snapper
37	<i>Lutjanus apodus</i>	schoolmaster
38	<i>Lutjanus buccanella</i>	blackfin snapper
39	<i>Lutjanus cyanopterus</i>	cupera snapper
40	<i>Lutjanus griseus</i>	gray snapper
41	<i>Lutjanus jocu</i>	dog snapper
42	<i>Lutjanus mahogoni</i>	mahogany snapper
43	<i>Lutjanus synagris</i>	lane snapper
44	<i>Melichthys niger</i>	black durgon
45	<i>Mycteroperca bonaci</i>	black grouper
46	<i>Mycteroperca microlepis</i>	gag grouper
47	<i>Mycteroperca phenax</i>	scamp
48	<i>Mycteroperca tigris</i>	tiger grouper
50	<i>Mycteroperca venenosa</i>	yellowfin grouper
51	<i>Mycteroperca interstitialis</i>	yellowmouth grouper
52	<i>Ocyurus chrysurus</i>	yellowtail snapper
53	<i>Pomacanthus arcuatus</i>	gray angelfish
54	<i>Pomacanthus paru</i>	French angelfish
55	<i>Priacanthus arenatus</i>	bigeye

Table FK07-02.

Summary of effort and catch data for Florida Keys visual survey sampling, 2007. Zones were located linearly along the Keys island chain from the Upper Keys (Zone A) through the Lower Keys (Zone D).

Visual Census		
Zone	# Fish	# Counts
A	8,729	288
B	10,556	240
C	6,368	152
D	8,858	324
Totals	34,511	1,004

Table FK07-03. Catch statistics for Selected Reef Fish Species observed in 936 point counts during Florida Keys sampling, 2007. Percent (%) is the percentage of the total observations represented by that species; percent occurrence (% Occur) is the percentage of samples in which the species was observed; CV is the coefficient of variation. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)			
	No.	%		Mean	Stderr	CV	Max
<i>Haemulon plumierii</i>	6,988	20.2	55.4	2.22	0.19	269.45	82.76
<i>Haemulon aurolineatum</i>	6,536	18.9	6.6	2.07	0.70	1,076.30	636.62
<i>Haemulon spp.</i>	3,994	11.6	7.1	1.27	0.23	587.10	95.49
<i>Ocyurus chrysurus</i>	3,563	10.3	43.0	1.13	0.14	400.11	75.44
<i>Haemulon flavolineatum</i>	2,846	8.2	22.3	0.90	0.13	470.77	95.49
<i>Haemulon sciurus</i>	2,228	6.5	19.0	0.71	0.08	381.18	31.83
<i>Haemulon melanurum</i>	1,223	3.5	5.7	0.39	0.13	1,095.42	95.49
<i>Lutjanus griseus</i>	1,046	3.0	12.2	0.33	0.06	608.50	39.15
<i>Lachnolaimus maximus</i>	935	2.7	40.9	0.30	0.02	185.84	5.09
<i>Lutjanus apodus</i>	632	1.8	9.3	0.20	0.04	607.10	19.10
<i>Anisotremus virginicus</i>	579	1.7	15.9	0.18	0.03	526.80	22.28
<i>Chaetodon capistratus</i>	477	1.4	24.3	0.15	0.01	204.67	2.55
<i>Pomacanthus arcuatus</i>	440	1.3	25.4	0.14	0.01	206.47	3.18
<i>Chaetodon sedentarius</i>	319	0.9	17.2	0.10	0.01	252.12	1.59
<i>Chaetodon ocellatus</i>	303	0.9	16.9	0.10	0.01	233.38	1.27
<i>Holacanthus tricolor</i>	260	0.8	16.0	0.08	0.01	290.25	2.23
<i>Lutjanus analis</i>	211	0.6	14.9	0.07	0.01	305.95	2.86

Table FK07-03. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)			
	No.	%		Mean	Stderr	CV	Max
<i>Haemulon striatum</i>	234	0.7	0.4	0.07	0.06	2,726.95	63.66
<i>Cephalopholis cruentata</i>	205	0.6	15.2	0.06	0.01	266.57	0.95
<i>Holacanthus ciliaris</i>	165	0.5	12.8	0.05	0.00	287.48	1.27
<i>Lutjanus synagris</i>	169	0.5	2.5	0.05	0.01	837.34	6.68
<i>Bodianus rufus</i>	134	0.4	10.5	0.04	0.00	319.27	0.95
<i>Mycteroperca bonaci</i>	126	0.4	10.1	0.04	0.00	339.60	1.59
<i>Holacanthus bermudensis</i>	111	0.3	8.4	0.04	0.00	370.98	1.27
<i>Haemulon parra</i>	123	0.4	2.1	0.04	0.01	1,103.75	7.96
<i>Haemulon chrysargyreum</i>	130	0.4	1.1	0.04	0.02	1,198.43	11.14
<i>Epinephelus morio</i>	82	0.2	7.1	0.03	0.00	407.87	1.59
<i>Pomacanthus paru</i>	82	0.2	6.6	0.03	0.00	404.19	0.95
<i>Chaetodon striatus</i>	73	0.2	5.6	0.02	0.00	437.93	0.64
<i>Epinephelus adscensionis</i>	36	0.1	2.8	0.01	0.00	708.38	1.59
<i>Balistes capriscus</i>	36	0.1	2.1	0.01	0.00	771.27	0.95
<i>Mycteroperca phenax</i>	32	0.1	2.2	0.01	0.00	747.82	1.27
<i>Bodianus pulchellus</i>	30	0.1	1.5	0.01	0.00	986.23	1.59
<i>Cephalopholus fulva</i>	25	0.1	2.0	0.01	0.00	764.82	0.95
<i>Haemulon macrostomum</i>	20	0.1	1.1	0.01	0.00	1,070.39	1.27
<i>Haemulon carbonarium</i>	30	0.1	0.6	0.01	0.01	2,002.50	5.09

Table FK07-03. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)			
	No.	%		Mean	Stderr	CV	Max
<i>Balistes vetula</i>	14	0.0	1.2	0.00	0.00	955.48	0.64
<i>Mycteroperca interstitialis</i>	11	0.0	1.0	0.00	0.00	1,034.28	0.64
<i>Mycteroperca microlepis</i>	10	0.0	0.9	0.00	0.00	1,093.61	0.64
<i>Lutjanus buccanella</i>	10	0.0	0.2	0.00	0.00	2,283.86	1.91
<i>Epinephelus itajara</i>	8	0.0	0.8	0.00	0.00	1,116.35	0.32
<i>Anisotremus surinamensis</i>	6	0.0	0.6	0.00	0.00	1,290.35	0.32
<i>Epinephelus striatus</i>	5	0.0	0.5	0.00	0.00	1,414.21	0.32
<i>Heteropriacanthus cruentatus</i>	5	0.0	0.2	0.00	0.00	2,612.28	1.27
<i>Epinephelus guttatus</i>	4	0.0	0.4	0.00	0.00	1,581.93	0.32
<i>Lutjanus mahogoni</i>	4	0.0	0.4	0.00	0.00	1,581.93	0.32
<i>Haemulon album</i>	3	0.0	0.3	0.00	0.00	1,827.56	0.32
<i>Canthidermis sufflamen</i>	3	0.0	0.2	0.00	0.00	2,360.79	0.64
<i>Lutjanus cyanopterus</i>	2	0.0	0.2	0.00	0.00	2,239.42	0.32
<i>Lutjanus jocu</i>	2	0.0	0.2	0.00	0.00	2,239.42	0.32
<i>Priacanthus arenatus</i>	1	0.0	0.1	0.00	0.00	3,168.60	0.32
Haemulids	24,940	72.3%	.	11.34	1.15	268.28	636.62
Other Species	9,571	27.7%	.	3.20	0.21	202.17	103.77
Totals	34,511	100.0	.	10.94	0.85	245.13	639.48

Table FK07-04. Size distribution of Selected Reef Fish Species recorded during 1,004 visual point count surveys in the Florida Keys during 2007. Shaded numbers indicate species at or above the minimum state recreational fishing size limit.

Scientific Name	Estimated Total Lengths (cm)																	Totals
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-69	70-79	80-89	90-99	100+	
<i>Haemulon plumierii</i>	216	649	1590	2191	1518	729	95	0	0	0	0	0	0	0	0	0	0	6988
<i>Haemulon aurolineatum</i>	3949	1760	455	343	21	8	0	0	0	0	0	0	0	0	0	0	0	6536
<i>Haemulon spp.</i>	3963	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3994
<i>Ocyurus chrysurus</i>	40	274	539	673	1097	732	147	46	13	2	0	0	0	0	0	0	0	3563
<i>Haemulon flavolineatum</i>	377	545	833	995	93	3	0	0	0	0	0	0	0	0	0	0	0	2846
<i>Haemulon sciurus</i>	33	84	296	679	794	277	60	5	0	0	0	0	0	0	0	0	0	2228
<i>Haemulon melanurum</i>	81	230	94	739	79	0	0	0	0	0	0	0	0	0	0	0	0	1223
<i>Lutjanus griseus</i>	0	5	68	194	390	206	93	58	29	3	0	0	0	0	0	0	0	1046
<i>Lachnolaimus maximus</i>	0	2	38	166	358	226	110	21	8	3	1	2	0	0	0	0	0	935
<i>Lutjanus apodus</i>	0	15	55	141	227	129	42	13	10	0	0	0	0	0	0	0	0	632
<i>Anisotremus virginicus</i>	50	18	70	158	168	81	32	2	0	0	0	0	0	0	0	0	0	579
<i>Chaetodon capistratus</i>	48	399	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	477
<i>Pomacanthus arcuatus</i>	5	6	14	25	76	118	139	48	9	0	0	0	0	0	0	0	0	440
<i>Chaetodon sedentarius</i>	55	243	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	319
<i>Chaetodon ocellatus</i>	32	43	226	2	0	0	0	0	0	0	0	0	0	0	0	0	0	303
<i>Holacanthus tricolor</i>	68	80	78	28	6	0	0	0	0	0	0	0	0	0	0	0	0	260
<i>Lutjanus analis</i>	0	3	0	6	8	32	47	41	34	11	10	9	5	3	2	0	0	211
<i>Haemulon striatum</i>	20	212	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	234
<i>Cephalopholis cruentata</i>	0	13	73	62	47	8	2	0	0	0	0	0	0	0	0	0	0	205
<i>Holacanthus ciliaris</i>	15	11	18	26	31	38	22	4	0	0	0	0	0	0	0	0	0	165
<i>Lutjanus synagris</i>	1	9	17	92	39	5	6	0	0	0	0	0	0	0	0	0	0	169
<i>Bodianus rufus</i>	32	17	26	26	17	9	5	2	0	0	0	0	0	0	0	0	0	134
<i>Mycteroperca bonaci</i>	0	0	1	6	7	17	23	23	11	13	9	7	2	5	2	0	0	126
<i>Holacanthus bermudensis</i>	8	5	5	9	15	25	25	11	8	0	0	0	0	0	0	0	0	111
<i>Haemulon parra</i>	52	2	0	1	15	53	0	0	0	0	0	0	0	0	0	0	0	123
<i>Haemulon chrysargyreum</i>	0	33	73	24	0	0	0	0	0	0	0	0	0	0	0	0	0	130
<i>Epinephelus morio</i>	0	0	2	4	1	3	3	17	11	13	9	4	13	2	0	0	0	82
<i>Pomacanthus paru</i>	5	0	3	8	17	29	17	2	1	0	0	0	0	0	0	0	0	82
<i>Chaetodon striatus</i>	10	29	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
<i>Epinephelus adscensionis</i>	0	1	0	8	5	6	7	7	2	0	0	0	0	0	0	0	0	36
<i>Balistes capriscus</i>	0	0	1	9	12	8	3	0	0	0	3	0	0	0	0	0	0	36
<i>Mycteroperca phenax</i>	0	0	0	7	8	4	7	3	0	1	2	0	0	0	0	0	0	32

Table FK07-04. Continued.

Scientific Name	Estimated Total Lengths (cm)																	Totals
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-69	70-79	80-89	90-99	100+	
<i>Bodianus pulchellus</i>	6	10	5	6	2	1	0	0	0	0	0	0	0	0	0	0	0	30
<i>Cephalopholus fulva</i>	0	0	1	6	10	5	2	0	1	0	0	0	0	0	0	0	0	25
<i>Haemulon macrostomum</i>	0	1	2	4	6	3	3	1	0	0	0	0	0	0	0	0	0	20
<i>Haemulon carbonarium</i>	0	0	0	16	2	0	12	0	0	0	0	0	0	0	0	0	0	30
<i>Balistes vetula</i>	0	0	0	1	3	6	3	0	1	0	0	0	0	0	0	0	0	14
<i>Mycteroperca interstitialis</i>	0	0	1	0	2	4	1	1	0	0	1	0	0	0	0	0	1	11
<i>Mycteroperca microlepis</i>	0	0	0	0	1	0	1	0	2	1	3	1	1	0	0	0	0	10
<i>Lutjanus buccanella</i>	0	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10
<i>Epinephelus itajara</i>	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	2	8
<i>Anisotremus surinamensis</i>	0	0	0	0	0	0	1	2	2	1	0	0	0	0	0	0	0	6
<i>Epinephelus striatus</i>	0	0	0	0	1	0	0	0	1	0	0	1	2	0	0	0	0	5
<i>Heteropriacanthus cruentatus</i>	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
<i>Epinephelus guttatus</i>	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	4
<i>Lutjanus mahogoni</i>	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	4
<i>Haemulon album</i>	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	3
<i>Canthidermis sufflamen</i>	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3
<i>Lutjanus cyanopterus</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
<i>Lutjanus jocu</i>	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
<i>Priacanthus arenatus</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	9066	4737	4673	6656	5083	2769	911	308	146	50	38	27	25	12	5	2	3	34511

Appendix FK07-01. Monthly summary of Selected Reef Fish Species observed during Florida Keys visual surveys (point counts), 2007. Effort, or total number of surveys, is labeled "E". Taxa are listed in alphabetical order.

Species	Month						Totals
	May	Jun	Jul	Aug	Sep	Oct	
	E=156	E=156	E=156	E=156	E=156	E=156	E=936
<i>Anisotremus surinamensis</i>	1	1	1	1	1	1	6
<i>Anisotremus virginicus</i>	58	104	119	43	158	97	579
<i>Balistes capriscus</i>	3	2	5	16	7	3	36
<i>Balistes vetula</i>	.	6	3	2	1	2	14
<i>Bodianus pulchellus</i>	4	1	.	.	2	23	30
<i>Bodianus rufus</i>	19	26	12	26	13	38	134
<i>Canthidermis sufflamen</i>	.	.	1	2	.	.	3
<i>Cephalopholis cruentata</i>	24	25	21	30	24	81	205
<i>Cephalopholis fulva</i>	4	.	1	3	10	7	25
<i>Chaetodon capistratus</i>	33	100	70	96	82	96	477
<i>Chaetodon ocellatus</i>	25	50	51	53	67	57	303
<i>Chaetodon sedentarius</i>	38	69	33	52	41	86	319
<i>Chaetodon striatus</i>	5	9	15	14	18	12	73
<i>Epinephelus adscensionis</i>	7	10	1	3	1	14	36
<i>Epinephelus guttatus</i>	1	.	1	1	1	.	4
<i>Epinephelus itajara</i>	2	2	1	.	2	1	8
<i>Epinephelus morio</i>	7	21	12	20	13	9	82
<i>Epinephelus striatus</i>	3	.	.	1	.	1	5
<i>Haemulon album</i>	.	.	2	.	.	1	3
<i>Haemulon aurolineatum</i>	304	150	2,431	577	1,997	1,077	6,536
<i>Haemulon carbonarium</i>	1	.	1	11	.	17	30
<i>Haemulon chrysargyreum</i>	.	50	22	4	51	3	130
<i>Haemulon flavolineatum</i>	253	389	592	234	654	724	2,846
<i>Haemulon macrostomum</i>	.	7	2	3	3	5	20
<i>Haemulon melanurum</i>	3	253	612	87	245	23	1,223
<i>Haemulon parra</i>	.	52	7	.	61	3	123

Appendix FK07-01. (Continued)

Species	Month						Totals
	May	Jun	Jul	Aug	Sep	Oct	
	E=124	E=176	E=176	E=176	E=176	E=176	E=1,004
<i>Haemulon plumierii</i>	459	1,087	895	1,013	1,720	1,814	6,988
<i>Haemulon sciurus</i>	228	500	323	212	369	596	2,228
<i>Haemulon</i> spp.	190	163	858	600	1,825	358	3,994
<i>Haemulon striatum</i>	13	.	.	20	1	200	234
<i>Heteropriacanthus cruentatus</i>	.	1	.	.	4	.	5
<i>Holacanthus bermudensis</i>	13	21	17	28	10	22	111
<i>Holacanthus ciliaris</i>	15	12	26	44	35	33	165
<i>Holacanthus tricolor</i>	38	22	23	45	42	90	260
<i>Lachnolaimus maximus</i>	77	212	121	163	171	191	935
<i>Lutjanus analis</i>	28	53	32	23	30	45	211
<i>Lutjanus apodus</i>	33	160	46	112	144	137	632
<i>Lutjanus buccanella</i>	.	4	.	.	.	6	10
<i>Lutjanus cyanopterus</i>	.	.	.	.	.	2	2
<i>Lutjanus griseus</i>	66	148	247	439	116	30	1,046
<i>Lutjanus jocu</i>	.	1	.	.	.	1	2
<i>Lutjanus mahogoni</i>	2	.	.	.	.	2	4
<i>Lutjanus synagris</i>	66	52	7	12	2	30	169
<i>Mycteroperca bonaci</i>	16	25	24	18	18	25	126
<i>Mycteroperca interstitialis</i>	5	.	.	2	.	4	11
<i>Mycteroperca microlepis</i>	3	2	.	2	1	2	10
<i>Mycteroperca phenax</i>	7	5	1	10	4	5	32
<i>Ocyurus chrysurus</i>	335	614	471	1,193	280	670	3,563
<i>Pomacanthus arcuatus</i>	47	86	86	80	89	52	440
<i>Pomacanthus paru</i>	9	19	18	17	9	10	82
<i>Priacanthus arenatus</i>	.	.	.	1	.	.	1
Totals	2,445	4,514	7,211	5,313	8,322	6,706	34,511

Appendix FK07-02. Summary by zone of species collected during Florida Keys visual surveys (point counts), 2007. Effort, or total number of surveys, is labeled "E". Taxa are listed in alphabetical order.

Species	Zone				Totals
	A	B	C	D	
	E=288	E=240	E=152	E=324	E=1,004
<i>Anisotremus surinamensis</i>	3	.	.	3	6
<i>Anisotremus virginicus</i>	143	104	109	223	579
<i>Balistes capriscus</i>	3	23	10	.	36
<i>Balistes vetula</i>	8	6	.	.	14
<i>Bodianus pulchellus</i>	.	1	5	24	30
<i>Bodianus rufus</i>	26	37	18	53	134
<i>Canthidermis sufflamen</i>	1	2	.	.	3
<i>Cephalopholus cruentata</i>	38	68	32	67	205
<i>Cephalopholus fulva</i>	17	4	.	4	25
<i>Chaetodon capistratus</i>	45	112	55	265	477
<i>Chaetodon ocellatus</i>	51	81	61	110	303
<i>Chaetodon sedentarius</i>	91	104	31	93	319
<i>Chaetodon striatus</i>	17	13	20	23	73
<i>Epinephelus adscensionis</i>	1	1	9	25	36
<i>Epinephelus guttatus</i>	2	1	.	1	4
<i>Epinephelus itajara</i>	1	2	2	3	8
<i>Epinephelus morio</i>	10	19	8	45	82
<i>Epinephelus striatus</i>	.	2	.	3	5
<i>Haemulon album</i>	.	.	.	3	3
<i>Haemulon aurolineatum</i>	1,437	3,379	1,027	693	6,536
<i>Haemulon carbonarium</i>	10	1	.	19	30
<i>Haemulon chrysargyreum</i>	87	.	43	.	130
<i>Haemulon flavolineatum</i>	605	662	765	814	2,846
<i>Haemulon macrostomum</i>	6	5	.	9	20
<i>Haemulon melanurum</i>	906	157	125	35	1,223
<i>Haemulon parra</i>	87	25	2	9	123
<i>Haemulon plumierii</i>	2,152	2,229	1,276	1,331	6,988
<i>Haemulon sciurus</i>	601	468	499	660	2,228
<i>Haemulon spp.</i>	512	1,631	327	1,524	3,994
<i>Haemulon striatum</i>	200	13	1	20	234

Appendix FK07-02. (Continued)

Species	Zone				Totals
	A	B	C	D	
	E=288	E=240	E=152	E=324	E=1,004
<i>Heteropriacanthus cruentatus</i>	.	1	4	.	5
<i>Holacanthus bermudensis</i>	14	35	20	42	111
<i>Holacanthus ciliaris</i>	34	52	25	54	165
<i>Holacanthus tricolor</i>	55	97	33	75	260
<i>Lachnolaimus maximus</i>	161	311	221	242	935
<i>Lutjanus analis</i>	78	72	24	37	211
<i>Lutjanus apodus</i>	178	96	105	253	632
<i>Lutjanus buccanella</i>	.	.	6	4	10
<i>Lutjanus cyanopterus</i>	1	1	.	.	2
<i>Lutjanus griseus</i>	254	81	331	380	1,046
<i>Lutjanus jocu</i>	1	.	.	1	2
<i>Lutjanus mahogoni</i>	.	1	.	3	4
<i>Lutjanus synagris</i>	11	.	.	158	169
<i>Mycteroperca bonaci</i>	19	45	27	35	126
<i>Mycteroperca interstitialis</i>	.	1	.	10	11
<i>Mycteroperca microlepis</i>	.	1	3	6	10
<i>Mycteroperca phenax</i>	.	7	5	20	32
<i>Ocyurus chrysurus</i>	703	476	1,065	1,319	3,563
<i>Pomacanthus arcuatus</i>	126	108	66	140	440
<i>Pomacanthus paru</i>	34	20	8	20	82
<i>Priacanthus arenatus</i>	.	1	.	.	1
Totals	8,729	10,556	6,368	8,858	34,511

Northeast Florida

Northeast Florida encompasses three coastal plain estuaries; each defined by their respective lower river basins (St. Marys River, Nassau River, and St. Johns River) and interconnected via the Intracoastal Waterway (ICW; Figure JX07-01). Shoreline vegetation in the lower St Marys and Nassau rivers are characterized by an expansive saltmarsh system while the lower St. Johns River is characterized by marshes, hardwood forests, and hardwood swamps (St. Johns River Water Management District 1993; St. Johns River Water Management District 2000). Bottom substrates are typically characterized as mud, sand, and occasional oysters (Solomon et al. 2006). Bottom vegetation is only present in the oligohaline reaches of the St. Johns River upriver of downtown Jacksonville (Burns et al. 1997).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in northeast Florida since 2001. The area sampled was divided into six geographically-defined riverine zones (A-F; Figure JX07-01). Monthly stratified-random sampling (SRS) was conducted in Zones A-D using 21.3-m river seines, 183-m haul seines, and 6.1-m river otter trawls. Monthly SRS was conducted in Zone E and F with only 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2007 in Northeast Florida.

Stratified-Random Sampling

A total of 221,028 fishes (156 taxa) and selected invertebrates (14 taxa) were collected from 1,356 northeast Florida samples in 2007 (Table JX07-01; Appendices JX07-01 and -02). *Anchoa mitchilli* (n=73,465) was the most numerous species collected, representing 33.2% of the total catch. The next three most abundant taxa, *Anchoa hepsetus* (n=18,340), *Lucania parva* (n=14,718), and *Micropogonias undulatus* (n=13,632) accounted for an additional 21.1% of the total catch. Thirty-four Selected Taxa (n=45,956 animals) composed 20.8% of the total catch. *Micropogonias undulatus* (n=13,632) was the most abundant Selected Taxon, representing 6.2% of the annual

catch. *Leiostomus xanthurus* (n=8,884) and *Litopenaeus setiferus* (n=7,370) were the next two most abundant Selected Taxa, comprising 7.4% of the total catch. New species collected from northeast Florida during 2007 included *Histrio histrio* (sargassumfish), *Hypleurochilus geminatus* (crested blenny), *Lactophrys trigonus* (trunkfish), *Ophidion marginatum* (striped cusk-eel), *Prionotus carolinus* (northern searobin), and *Sicyonia brevirostris* (brown rock shrimp).

21.3-m River Seines. A total of 162,324 animals were collected in 576 21.3-m river seine samples, representing 73.4% of the overall SRS collections (Table JX07-01). *Anchoa mitchilli* (n=62,468) was the most abundant species collected, accounting for 38.5% of the 21.3-m river seine catch (Table JX07-02). The taxa most frequently caught in 21.3-m river seines were *A. mitchilli* (41.8% occurrence) and *Menidia* spp. (36.6% occurrence).

A total of 15,322 animals from 27 Selected Taxa were collected, representing 9.4% of the entire 21.3-m river seine catch (Table JX07-03). *Leiostomus xanthurus* (n=5,131), *L. setiferus* (n=4,910), *Mugil cephalus* (n=2,158), and *M. undulatus* (n=938) were the most abundant Selected Taxa, accounting for 85.7% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *L. xanthurus* (33.7% occurrence), *Callinectes sapidus* (31.9% occurrence), and *L. setiferus* (23.6% occurrence).

183-m Haul Seines. A total of 22,589 animals were collected in 192 183-m haul seines, representing 10.2% of the overall SRS catch (Table JX07-01). *Mugil cephalus* (n=3,319), *Mugil curema* (n=2,795), *L. xanthurus* (n=2,024), *Lagodon rhomboides* (n=1,805), and *Bairdiella chrysoura* (n=1,576), were the most abundant species, accounting for 51.0% of the 183-m haul seine catch (Table JX07-04). The taxa most frequently caught in the 183-m haul seines were *M. cephalus* (77.1% occurrence), *Dasyatis sabina* (67.2% occurrence), and *M. curema* (66.7% occurrence).

A total of 11,417 animals from 29 Selected Taxa were collected, representing 50.5% of the entire 183-m haul seine catch (Table JX07-05). *Mugil cephalus* (n=3,319), *M. curema* (n=2,795), and *L. xanthurus* (n=2,024) were the most abundant Selected Taxa, accounting for 71.2% of the Selected Taxa collected with this gear. The Selected

Taxa most frequently caught in 183-m haul seines were *M. cephalus* (77.1% occurrence), *M. curema* (66.7% occurrence), and *L. xanthurus* (56.8% occurrence).

6.1-m River Otter Trawl. A total of 36,115 animals were collected in 588 6.1-m river otter trawl samples, representing 16.3% of the overall SRS catch (Table JX07-01). *Micropogonias undulatus* (n=12,287), *A. mitchilli* (n=10,997), *C. sapidus* (n=1,864), *L. xanthurus* (n=1,729), *L. setiferus* (n=1,601) were the most abundant species collected, accounting for 78.9% of the 6.1-m river otter trawl catch (Table JX07-06). The taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (65.1% occurrence), *M. undulatus* (49.4% occurrence), and *A. mitchilli* (44.6% occurrence).

A total of 19,207 animals from 23 Selected Taxa were collected, representing 53.2% of the entire 6.1-m river otter trawl catch (Table JX07-07). *Micropogonias undulatus* (n=12,287), *C. sapidus* (n=1,864), *L. xanthurus* (n=1,729) and *L. setiferus* (n=1,601) were the most abundant Selected Taxa, accounting for 91.0% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in the 6.1-m river otter trawls were *C. sapidus* (65.1% occurrence), *M. undulatus* (49.4% occurrence), and *L. setiferus* (34.1% occurrence).

References

Burns, J.W., Jr., A.D. Chapman, E. Messer, and J.Konwinski. 1997. Submerged Aquatic Vegetation of the Lower St. Johns River. Palatka, Fla.: St. Johns River Water Management District.

Solomon, J.J., Brodie, R.B., and G. Ehlinger. 2006. Distribution and abundance of fish assemblages and select macroinvertebrates from the lower St. Marys River Basin in northeast Florida. Florida Scientist Vol 69(1):1-18.

St. Johns River Water Management District. 1993. Lower St. Johns River Basin SWIM Plan. 3 pp.

St. Johns River Water Management District. 2000. St. Marys River Basin: Overview Issues and Strategies. 4 pp.

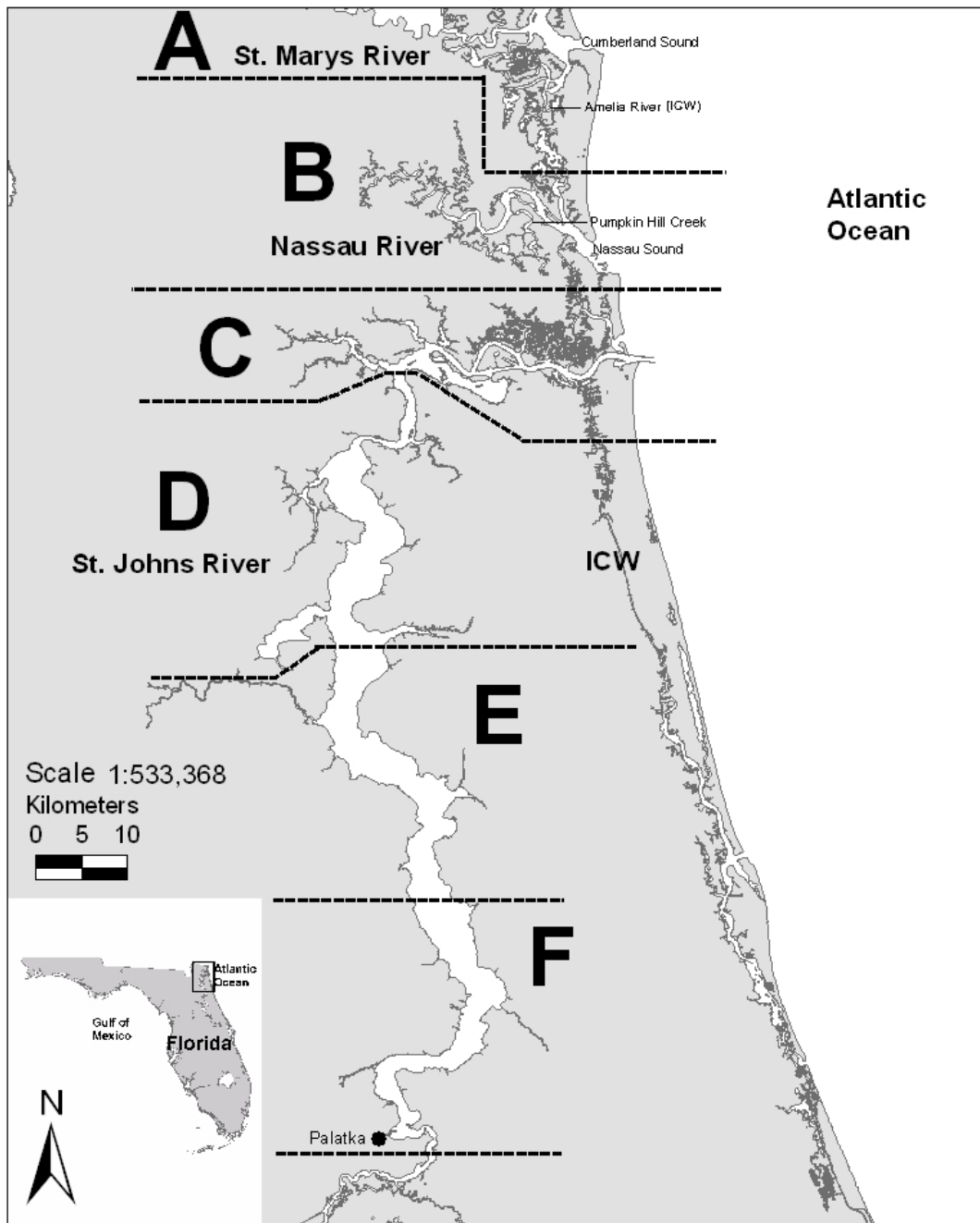


Figure JX07-01. Map of Northeast Florida sampling area. Zones are labeled A – F.

Table JX07-01. Summary of catch and effort data for Northeast Florida stratified-random sampling, 2007.

Zone	21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	30,563	84	3,830	36	4,512	84	38,905	204
B	31,765	84	5,076	36	2,945	84	39,786	204
C	38,648	108	5,826	60	3,587	108	48,061	276
D	8,232	108	7,857	60	11,983	120	28,072	288
E	12,565	96	.	.	5,770	96	18,335	192
F	40,551	96	.	.	7,318	96	47,869	192
Totals	162,324	576	22,589	192	36,115	588	221,028	1,356

Table JX07-02. Catch statistics for 10 dominant taxa collected in 576 21.3-m river seine samples during Northeast Florida stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Anchoa mitchilli</i>	62,468	38.5	41.8	159.49	34.71	522.34	14,564.71	33	0.04	15	90
<i>Anchoa hepsetus</i>	17,770	10.9	16.1	45.37	36.26	1,918.08	20,730.88	36	0.05	19	107
<i>Lucania parva</i>	14,717	9.1	22.7	37.57	6.32	403.56	1,616.18	24	0.04	10	45
<i>Menidia menidia</i>	13,121	8.1	32.8	33.50	6.72	481.49	1,877.94	45	0.13	17	94
<i>Menidia</i> spp.	9,924	6.1	36.6	25.34	4.53	429.35	1,741.18	36	0.08	13	71
<i>Dorosoma petenense</i>	5,410	3.3	3.8	13.81	12.23	2,125.82	7,035.29	40	0.09	20	106
<i>Leiostomus xanthurus</i>	5,131	3.2	33.7	13.10	2.17	397.57	698.53	31	0.27	10	122
<i>Litopenaeus setiferus</i>	4,910	3.0	23.6	12.54	2.66	508.83	889.71	14	0.06	2	33
<i>Gambusia holbrooki</i>	3,060	1.9	10.9	7.81	3.33	1,023.78	1,682.35	22	0.11	10	48
<i>Membras martinica</i>	2,391	1.5	6.8	6.10	2.36	929.13	1,123.53	47	0.19	21	76
Subtotal	138,902	85.6	.	.	.	.	.	.	.	2	122
Totals	162,324	100.0	.	414.43	59.12	342.34	24,313.24	.	.	2	785

Table JX07-03. Catch statistics for Selected Taxa collected in 576 21.3-m river seine samples during Northeast Florida stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Leiostomus xanthurus</i>	5,131	3.2	33.7	13.10	2.17	397.57	698.53	31	0.27	10	122
<i>Litopenaeus setiferus</i>	4,910	3.0	23.6	12.54	2.66	508.83	889.71	14	0.06	2	33
<i>Mugil cephalus</i>	2,158	1.3	20.5	5.51	1.89	821.59	766.18	32	0.71	17	336
<i>Micropogonias undulatus</i>	938	0.6	15.6	2.39	0.55	551.81	195.59	32	0.65	9	186
<i>Callinectes sapidus</i>	536	0.3	31.9	1.37	0.14	245.02	32.35	49	1.82	6	189
<i>Farfantepenaeus</i> spp.	483	0.3	15.6	1.23	0.34	663.89	158.82	9	0.12	3	14
<i>Cynoscion nebulosus</i>	282	0.2	11.8	0.72	0.17	558.56	69.12	49	1.97	13	296
<i>Mugil curema</i>	192	0.1	8.5	0.49	0.13	621.02	42.65	79	2.58	18	175
<i>Sciaenops ocellatus</i>	139	0.1	9.4	0.35	0.09	588.44	29.41	58	8.56	6	664
<i>Trachinotus carolinus</i>	137	0.1	1.2	0.35	0.26	1,751.63	144.12	32	1.41	20	105
<i>Paralichthys lethostigma</i>	73	0.0	6.9	0.19	0.04	524.16	16.18	104	11.69	9	426
<i>Menticirrhus americanus</i>	55	0.0	2.4	0.14	0.05	890.51	20.59	57	4.50	15	146
<i>Paralichthys albigutta</i>	54	0.0	4.7	0.14	0.03	539.21	7.35	54	4.28	14	150
<i>Farfantepenaeus duorarum</i>	47	0.0	2.8	0.12	0.04	892.81	19.12	18	0.35	15	27
<i>Farfantepenaeus aztecus</i>	35	0.0	2.1	0.09	0.03	886.57	11.76	18	0.28	15	22
<i>Lutjanus griseus</i>	27	0.0	3.6	0.07	0.02	560.80	4.41	68	11.07	13	188
<i>Trachinotus falcatus</i>	27	0.0	1.9	0.07	0.03	981.59	11.76	21	1.76	10	35

Table JX07-03. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Archosargus probatocephalus</i>	20	0.0	2.3	0.05	0.02	808.41	7.35	71	14.23	16	230
<i>Pogonias cromis</i>	16	0.0	1.0	0.04	0.03	1,556.99	14.71	169	15.89	21	291
<i>Pomatomus saltatrix</i>	14	0.0	1.9	0.04	0.01	798.52	4.41	64	6.71	18	109
<i>Cynoscion complex</i>	13	0.0	1.6	0.03	0.01	880.48	4.41	38	5.00	21	82
<i>Elops saurus</i>	10	0.0	1.2	0.03	0.01	955.61	2.94	92	28.71	26	240
<i>Lutjanus synagris</i>	10	0.0	0.9	0.03	0.01	1,172.51	4.41	35	4.68	22	60
<i>Mycteroperca microlepis</i>	8	0.0	0.9	0.02	0.01	1,196.87	4.41	30	7.97	16	71
<i>Paralichthys dentatus</i>	7	0.0	0.7	0.02	0.01	1,325.26	4.41	56	7.10	33	81
<i>Menticirrhus saxatilis</i>	5	0.0	0.5	0.01	0.01	1,437.77	2.94	83	8.60	61	110
<i>Scomberomorus maculatus</i>	4	0.0	0.3	0.01	0.01	1,896.38	4.41	42	10.56	29	73
<i>Paralichthys squamilentus</i>	1	0.0	0.2	0.00	0.00	2,400.00	1.47	44	.	44	44
Totals	15,332	9.5	78.3	39.14	4.06	248.79	904.41	.	.	2	664

Table JX07-04. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Northeast Florida stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Mugil cephalus</i>	3,319	14.7	77.1	17.29	5.36	430.03	889.00	203	0.77	80	488
<i>Mugil curema</i>	2,795	12.4	66.7	14.56	3.61	343.62	502.00	137	0.67	84	285
<i>Leiostomus xanthurus</i>	2,024	9.0	56.8	10.54	1.87	245.27	204.00	120	0.62	40	232
<i>Lagodon rhomboides</i>	1,805	8.0	38.5	9.40	2.18	321.93	244.00	109	0.50	44	228
<i>Bairdiella chrysoura</i>	1,576	7.0	24.5	8.21	3.60	608.55	613.00	129	0.41	90	195
<i>Eucinostomus harengulus</i>	1,507	6.7	29.2	7.85	3.75	662.09	568.00	98	0.28	43	135
<i>Brevoortia</i> spp.	1,080	4.8	22.9	5.63	1.97	485.81	248.00	162	1.19	82	292
<i>Dasyatis sabina</i>	967	4.3	67.2	5.04	0.71	196.09	100.00	229	1.42	103	423
<i>Litopenaeus setiferus</i>	859	3.8	17.2	4.47	1.99	614.81	291.00	21	0.14	11	40
<i>Chloroscombrus chrysurus</i>	831	3.7	13.5	4.33	1.99	637.71	349.00	84	0.60	37	152
Subtotal	16,763	74.4	.	.	.	.	.	.	.	11	488
Totals	22,589	100.0	.	117.65	10.67	125.71	1,020.00	.	.	11	1170

Table JX07-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Northeast Florida stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Mugil cephalus</i>	3,319	14.7	77.1	17.29	5.36	430.03	889.00	203	0.77	80	488
<i>Mugil curema</i>	2,795	12.4	66.7	14.56	3.61	343.62	502.00	137	0.67	84	285
<i>Leiostomus xanthurus</i>	2,024	9.0	56.8	10.54	1.87	245.27	204.00	120	0.62	40	232
<i>Litopenaeus setiferus</i>	859	3.8	17.2	4.47	1.99	614.81	291.00	21	0.14	11	40
<i>Elops saurus</i>	520	2.3	23.4	2.71	1.94	991.23	371.00	266	2.41	49	589
<i>Callinectes sapidus</i>	409	1.8	51.6	2.13	0.47	308.52	82.00	121	1.78	26	231
<i>Micropogonias undulatus</i>	407	1.8	18.2	2.12	0.78	508.71	127.00	140	1.88	45	263
<i>Cynoscion nebulosus</i>	220	1.0	26.6	1.15	0.21	255.41	18.00	243	5.25	100	489
<i>Archosargus probatocephalus</i>	127	0.6	20.8	0.66	0.18	383.18	27.00	336	5.84	108	461
<i>Paralichthys albigutta</i>	121	0.5	20.3	0.63	0.13	284.21	11.00	113	3.45	44	221
<i>Pomatomus saltatrix</i>	111	0.5	18.2	0.58	0.16	375.23	19.00	226	5.78	105	363
<i>Menticirrhus americanus</i>	106	0.5	17.2	0.55	0.17	438.52	29.00	199	4.69	75	320
<i>Sciaenops ocellatus</i>	88	0.4	25.0	0.46	0.08	235.05	7.00	316	16.64	72	600
<i>Paralichthys lethostigma</i>	85	0.4	21.4	0.44	0.10	307.24	11.00	221	8.05	84	420
<i>Centropomus undecimalis</i>	38	0.2	1.0	0.20	0.19	1,349.48	37.00	332	5.83	263	491
<i>Trachinotus falcatus</i>	35	0.2	5.2	0.18	0.07	545.14	10.00	124	7.04	41	200
<i>Pogonias cromis</i>	35	0.2	6.3	0.18	0.08	581.50	10.00	204	9.81	142	343

Table JX07-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Farfantepenaeus duorarum</i>	30	0.1	5.2	0.16	0.06	538.68	7.00	23	0.74	17	30
<i>Scomberomorus maculatus</i>	29	0.1	8.9	0.15	0.04	366.78	4.00	211	10.80	146	322
<i>Lutjanus griseus</i>	22	0.1	7.8	0.11	0.03	386.60	3.00	182	4.52	137	230
<i>Trachinotus carolinus</i>	13	0.1	3.1	0.07	0.04	725.75	6.00	175	15.86	71	249
<i>Paralichthys dentatus</i>	10	0.0	3.6	0.05	0.02	546.59	2.00	128	16.13	62	224
<i>Lutjanus synagris</i>	4	0.0	1.6	0.02	0.01	844.82	2.00	96	1.89	90	98
<i>Cynoscion complex</i>	3	0.0	1.6	0.02	0.01	795.80	1.00	208	55.56	128	315
<i>Albula vulpes</i>	2	0.0	0.5	0.01	0.01	1,385.64	2.00	199	13.00	186	212
<i>Farfantepenaeus</i> sp.	1	0.0	0.5	0.01	0.01	1,385.64	1.00	14	.	14	14
<i>Menippe</i> sp.	1	0.0	0.5	0.01	0.01	1,385.64	1.00	84	.	84	84
<i>Rachycentron canadum</i>	1	0.0	0.5	0.01	0.01	1,385.64	1.00	164	.	164	164
<i>Menticirrhus littoralis</i>	1	0.0	0.5	0.01	0.01	1,385.64	1.00	285	.	285	285
<i>Paralichthys squamilentus</i>	1	0.0	0.5	0.01	0.01	1,385.64	1.00	67	.	67	67
Totals	11,417	50.5	98.4	59.46	7.65	178.33	960.00	.	.	11	600

Table JX07-06. Catch statistics for 10 dominant taxa collected in 588 river 6.1-m otter trawl samples during Northeast Florida stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Micropogonias undulatus</i>	12,287	34.0	49.4	2.92	0.54	447.71	217.81	34	0.21	7	268
<i>Anchoa mitchilli</i>	10,997	30.4	44.6	2.51	0.55	533.55	212.27	36	0.12	9	71
<i>Callinectes sapidus</i>	1,864	5.2	65.1	0.44	0.03	182.04	8.60	113	1.06	6	227
<i>Leiostomus xanthurus</i>	1,729	4.8	22.3	0.40	0.12	719.93	51.27	45	0.73	11	192
<i>Litopenaeus setiferus</i>	1,601	4.4	34.1	0.37	0.05	328.46	12.41	18	0.20	3	37
<i>Stellifer lanceolatus</i>	668	1.8	3.6	0.17	0.12	1,713.84	68.81	47	0.55	7	115
<i>Cynoscion complex</i>	604	1.7	19.3	0.14	0.02	416.90	8.83	49	1.30	8	247
<i>Anchoa hepsetus</i>	570	1.6	3.1	0.13	0.12	2,301.28	73.12	31	0.22	12	87
<i>Callinectes similis</i>	551	1.5	13.5	0.13	0.03	503.20	7.96	63	0.93	15	123
<i>Trinectes maculatus</i>	518	1.4	24.0	0.12	0.02	350.93	4.65	51	1.13	7	133
Subtotal	31,389	86.8	.	.	.	.	.	.	.	3	268
Totals	36,115	100.0	.	8.42	0.84	241.88	226.66	.	.	2	1050

Table JX07-07. Catch statistics for Selected Taxa collected in 588 river 6.1-m otter trawl samples during Northeast Florida stratified-random sampling, 2007. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Micropogonias undulatus</i>	12,287	34.0	49.4	2.92	0.54	447.71	217.81	34	0.21	7	268
<i>Callinectes sapidus</i>	1,864	5.2	65.1	0.44	0.03	182.04	8.60	113	1.06	6	227
<i>Leiostomus xanthurus</i>	1,729	4.8	22.3	0.40	0.12	719.93	51.27	45	0.73	11	192
<i>Litopenaeus setiferus</i>	1,601	4.4	34.1	0.37	0.05	328.46	12.41	18	0.20	3	37
<i>Cynoscion complex</i>	604	1.7	19.3	0.14	0.02	416.90	8.83	49	1.30	8	247
<i>Farfantepenaeus duorarum</i>	377	1.0	12.3	0.10	0.04	971.61	20.57	23	0.18	15	37
<i>Farfantepenaeus spp.</i>	243	0.7	14.8	0.06	0.01	341.31	1.35	10	0.19	3	14
<i>Menticirrhus americanus</i>	127	0.4	8.2	0.03	0.01	1,065.91	8.09	47	2.13	13	144
<i>Paralichthys lethostigma</i>	109	0.3	14.3	0.03	0.00	268.47	0.40	166	7.30	12	400
<i>Archosargus probatocephalus</i>	48	0.1	3.9	0.01	0.00	652.80	1.18	198	14.82	32	420
<i>Elops saurus</i>	46	0.1	3.6	0.01	0.00	849.33	1.95	38	0.78	23	45
<i>Paralichthys albigutta</i>	38	0.1	4.6	0.01	0.00	514.06	0.45	125	8.17	12	230
<i>Pogonias cromis</i>	26	0.1	1.4	0.01	0.00	1,774.21	2.56	154	4.01	99	190
<i>Cynoscion nebulosus</i>	22	0.1	2.2	0.00	0.00	945.49	0.86	65	12.90	13	213
<i>Farfantepenaeus aztecus</i>	20	0.1	2.2	0.00	0.00	845.05	0.75	18	0.58	15	22
<i>Paralichthys dentatus</i>	13	0.0	1.5	0.00	0.00	861.89	0.30	148	21.56	15	251
<i>Lutjanus griseus</i>	13	0.0	1.7	0.00	0.00	871.09	0.45	75	7.53	14	109

Table JX07-07. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/100m ²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
<i>Cynoscion nothus</i>	12	0.0	0.7	0.00	0.00	1,590.23	1.05	27	1.96	13	38
<i>Lutjanus synagris</i>	10	0.0	1.7	0.00	0.00	762.17	0.15	83	9.69	24	123
<i>Menippe</i> spp.	9	0.0	1.0	0.00	0.00	1,200.58	0.49	53	12.03	24	132
<i>Menticirrhus saxatilis</i>	6	0.0	0.7	0.00	0.00	1,433.29	0.45	31	5.89	15	50
<i>Mycteroperca microlepis</i>	1	0.0	0.2	0.00	0.00	2,422.81	0.13	142	.	142	142
<i>Sciaenops ocellatus</i>	1	0.0	0.2	0.00	0.00	2,422.81	0.13	137	.	137	137
<i>Mugil cephalus</i>	1	0.0	0.2	0.00	0.00	2,422.81	0.11	234	.	234	234
Totals	19,207	53.2	90.5	4.53	0.60	318.73	224.41	.	.	3	420

Appendix JX07-01.

Monthly summary of species collected during Northeast Florida stratified-random sampling, 2007. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113		E=1,356
<i>Abudefduf saxatilis</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Achirus lineatus</i>	.	1	3	6	5	4	5	13	16	31	7	7	98
<i>Albula vulpes</i>	.	.	.	.	2	.	.	.	.	.	.	.	2
<i>Alosa aestivalis</i>	.	.	.	.	.	.	.	.	.	.	.	1	1
<i>Alosa sapidissima</i>	.	.	.	.	4	.	.	.	.	.	.	.	4
<i>Aluterus schoepfii</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Ameiurus catus</i>	16	28	24	11	17	9	6	10	15	12	13	16	177
<i>Ameiurus nebulosus</i>	1	2	1	1	.	.	.	1	.	.	1	1	8
<i>Amia calva</i>	.	.	.	.	1	2	.	.	1	.	.	.	4
<i>Anchoa hepsetus</i>	1	2	8	7	625	668	2,659	142	14,186	30	3	9	18,340
<i>Anchoa lyolepis</i>	.	.	.	.	1	.	.	.	1,600	7	.	.	1,608
<i>Anchoa mitchilli</i>	12,575	327	645	5,870	2,648	9,989	13,362	12,348	1,812	7,857	2,884	3,148	73,465
<i>Ancylosetta quadrocellata</i>	2	4	6	2	7	1	.	.	.	.	.	.	22
<i>Anguilla rostrata</i>	.	.	.	1	.	.	.	.	.	.	1	.	2
<i>Archosargus probatocephalus</i>	19	7	13	9	14	8	37	20	7	35	8	18	195
<i>Ariopsis felis</i>	.	.	1	4	3	2	2	19	21	3	3	.	58
<i>Astroscopus y-graecum</i>	.	2	1	6	.	.	.	.	.	1	2	2	14
<i>Bagre marinus</i>	.	.	.	.	.	1	22	1	.	.	.	.	24
<i>Bairdiella chrysoura</i>	290	25	630	177	750	1,227	266	124	89	155	272	96	4,101
<i>Bathygobius soporator</i>	3	.	1	2	.	2	4	.	3	.	1	1	17
<i>Brevoortia</i> spp.	28	88	347	31	10	555	6	136	198	46	242	59	1,746
<i>Callinectes ornatus</i>	.	.	.	.	.	.	14	1	.	.	.	.	15
<i>Callinectes sapidus</i>	176	209	252	219	231	204	294	276	291	282	203	172	2,809
<i>Callinectes similis</i>	22	3	17	74	93	161	184	100	69	144	16	10	893

Appendix JX07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
<i>Caranx crysos</i>	.	.	.	.	.	.	1	2	.	.	.	.	3
<i>Caranx hippos</i>	.	.	.	8	8	16	30	41	29	22	1	9	164
<i>Caranx latus</i>	.	.	.	.	.	.	.	.	5	1	.	11	17
<i>Centropomus undecimalis</i>	37	.	.	.	.	.	.	.	.	.	1	.	38
<i>Centropristis philadelphica</i>	4	.	3	2	22	.	1	6	6	6	2	3	55
<i>Centropristis striata</i>	.	.	.	.	.	.	.	4	.	.	.	.	4
<i>Chaetodipterus faber</i>	1	.	.	2	2	13	13	109	26	6	.	.	172
<i>Charybdis hellerii</i>	.	.	.	.	.	.	.	1	.	.	.	.	1
<i>Chasmodes bosquianus</i>	.	.	.	1	.	.	3	.	.	1	.	2	7
<i>Chilomycterus schoepfii</i>	11	2	13	8	1	21	54	35	18	18	4	9	194
<i>Chloroscombrus chrysurus</i>	.	.	.	.	.	1	64	329	75	500	21	1	991
<i>Citharichthys macrops</i>	.	.	.	.	.	2	.	.	1	.	.	.	3
<i>Citharichthys spilopterus</i>	11	27	24	51	144	119	232	125	65	19	4	.	821
<i>Clupeidae spp.</i>	.	.	.	.	1	1	.	.	.	.	.	.	2
<i>Ctenogobius boleosoma</i>	12	2	10	4	1	1	4	5	10	6	8	36	99
<i>Ctenogobius shufeldti</i>	4	1	2	4	1	1	.	2	1	3	11	5	35
<i>Ctenogobius smaragdus</i>	1	.	1	.	.	.	.	5	2	17	2	3	31
<i>Cynoscion nebulosus</i>	39	22	22	26	35	47	51	37	114	75	39	17	524
<i>Cynoscion nothus</i>	.	.	.	.	.	.	.	.	.	12	.	.	12
<i>Cynoscion complex</i>	5	.	2	2	8	81	97	60	173	149	37	6	620
<i>Cyprinodon variegatus</i>	.	.	.	.	.	.	.	.	.	.	1	1	2
<i>Dasyatis sabina</i>	98	123	119	77	82	52	200	118	74	72	76	63	1,154
<i>Dasyatis say</i>	.	.	3	9	5	2	5	1	4	.	.	.	29
<i>Diapterus auratus</i>	10	4	8	6	5	2	2	19	15	17	37	30	155
<i>Dorosoma cepedianum</i>	7	.	.	.	93	4	1	1	1	1	25	2	135
<i>Dorosoma petenense</i>	2	28	9	18	32	2	7	4,976	386	29	108	1	5,598

Appendix JX07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
<i>Elops saurus</i>	1	1	6	40	37	11	42	24	382	22	6	4	576
<i>Esox niger</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Etropus crossotus</i>	16	6	36	40	1	24	42	41	58	88	77	7	436
<i>Eucinostomus gula</i>	35	1	6	6	23	6	10	2	6	7	9	25	136
<i>Eucinostomus harengulus</i>	88	23	110	53	1,051	189	79	65	146	111	97	287	2,299
<i>Eucinostomus spp.</i>	11	13	21	6	8	5	9	114	244	438	176	623	1,668
<i>Evorthodus lyricus</i>	1	.	.	.	.	.	.	.	.	.	.	.	1
<i>Farfantepenaeus aztecus</i>	2	1	1	11	10	26	2	1	.	.	.	1	55
<i>Farfantepenaeus duorarum</i>	5	3	14	23	28	307	54	10	1	8	1	.	454
<i>Farfantepenaeus spp.</i>	21	8	25	65	120	51	15	34	31	239	81	37	727
<i>Fundulus heteroclitus</i>	635	18	40	139	13	159	712	16	32	86	181	136	2,167
<i>Fundulus majalis</i>	5	.	.	10	2	37	6	34	55	21	.	21	191
<i>Fundulus seminolis</i>	26	156	107	50	70	150	70	110	57	70	59	19	944
<i>Gambusia holbrooki</i>	78	11	1,776	575	.	12	54	81	.	30	213	230	3,060
<i>Gobiesox strumosus</i>	.	.	.	.	1	.	3	.	.	.	.	.	4
<i>Gobiidae sp.</i>	.	.	.	.	.	1	.	.	.	.	.	.	1
<i>Gobioides broussonetii</i>	.	.	.	1	4	3	7	.	3	.	1	.	19
<i>Gobionellus oceanicus</i>	3	1	2	2	.	2	2	.	2	2	2	1	19
<i>Gobiosoma bosc</i>	25	15	50	65	33	11	10	20	1	9	10	13	262
<i>Gobiosoma robustum</i>	5	7	9	13	13	1	4	4	.	3	.	1	60
<i>Gobiosoma spp.</i>	118	14	68	33	1	12	14	72	27	16	38	38	451
<i>Gymnura micrura</i>	1	.	4	4	3	.	20	34	12	2	7	5	92
<i>Harengula jaguana</i>	.	.	.	.	2	9	.	.	.	21	11	.	43
<i>Heterandria formosa</i>	.	4	37	118	.	2	.	.	.	.	13	.	174
<i>Hippocampus erectus</i>	.	.	1	.	.	.	.	.	.	.	1	.	2
<i>Histrio histrio</i>	.	.	.	.	.	.	.	.	.	1	.	.	1

Appendix JX07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
<i>Hypleurochilus geminatus</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Hypsoblennius hentz</i>	1	.	.	.	.	1	1	.	.	.	.	.	3
<i>Ictalurus punctatus</i>	14	.	3	2	1	.	1	.	3	.	.	2	26
<i>Jordanella floridae</i>	.	.	2	.	.	.	.	.	.	.	.	.	2
<i>Labidesthes sicculus</i>	.	.	.	.	6	.	.	.	.	.	.	2	8
<i>Lactophrys trigonus</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Lagodon rhomboides</i>	29	25	64	298	139	241	617	487	313	401	167	274	3,055
<i>Larimus fasciatus</i>	.	.	.	.	.	.	.	.	2	.	.	.	2
<i>Leiostomus xanthurus</i>	402	1,945	2,002	2,106	816	302	308	245	344	136	228	50	8,884
<i>Lepisosteus osseus</i>	4	.	12	2	3	.	4	5	26	15	17	3	91
<i>Lepisosteus platyrhincus</i>	1	.	.	1	7	1	3	.	1	1	4	2	21
<i>Lepomis auritus</i>	47	9	26	16	6	11	1	20	19	20	6	5	186
<i>Lepomis gulosus</i>	.	.	1	.	6	1	.	.	1	1	.	.	10
<i>Lepomis macrochirus</i>	334	12	44	45	52	79	25	35	41	111	71	63	912
<i>Lepomis microlophus</i>	28	10	10	6	40	15	3	13	13	16	20	25	199
<i>Lepomis punctatus</i>	1	3	.	.	1	.	.	.	.	.	.	1	6
<i>Lepomis spp.</i>	4	.	.	.	.	.	.	49	56	65	4	67	245
<i>Limulus polyphemus</i>	4	.	3	.	1	1	.	.	2	.	3	.	14
<i>Litopenaeus setiferus</i>	25	41	48	73	16	467	2,089	710	803	1,377	1,265	456	7,370
<i>Lobotes surinamensis</i>	.	.	.	1	1	.	.	.	1	2	1	.	6
<i>Loricariidae sp.</i>	.	.	.	.	.	.	.	.	.	.	1	.	1
<i>Lucania goodei</i>	7	13	43	43	15	40	63	.	.	1	21	6	252
<i>Lucania parva</i>	351	1,160	2,212	3,035	2,153	2,778	416	810	119	630	417	637	14,718
<i>Lutjanus griseus</i>	3	.	2	1	4	2	2	18	11	10	5	4	62
<i>Lutjanus synagris</i>	2	1	.	.	.	4	4	4	2	5	1	1	24
<i>Membras martinica</i>	.	.	4	7	.	131	677	707	811	50	4	.	2,391

Appendix JX07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113		E=1,356
<i>Menidia menidia</i>	390	1,257	71	282	1,347	1,476	1,443	3,464	1,443	500	574	875	13,122
<i>Menidia</i> spp.	2,696	1,922	1,158	799	586	437	292	317	491	210	213	804	9,925
<i>Menippe</i> spp.	.	.	1	.	1	.	5	1	.	.	.	2	10
<i>Menticirrhus americanus</i>	3	.	8	27	57	77	24	30	23	15	17	7	288
<i>Menticirrhus littoralis</i>	.	.	.	.	.	.	1	.	.	.	.	.	1
<i>Menticirrhus saxatilis</i>	.	.	.	1	6	2	2	.	.	.	.	.	11
<i>Microgobius gulosus</i>	58	48	48	144	16	15	21	20	32	153	53	64	672
<i>Microgobius thalassinus</i>	17	4	27	34	9	3	12	6	7	18	45	7	189
<i>Microphis brachyurus</i>	.	.	.	.	.	.	.	.	.	3	2	.	5
<i>Micropogonias undulatus</i>	1,104	1,072	3,732	3,979	675	174	284	157	25	25	768	1,637	13,632
<i>Micropterus salmoides</i>	14	4	6	99	173	147	19	9	22	2	2	4	501
<i>Morone saxatilis</i>	.	.	.	.	1	1	.	.	.	.	.	.	2
<i>Mugil cephalus</i>	1,299	430	476	641	100	94	784	149	83	1,091	136	195	5,478
<i>Mugil curema</i>	687	172	95	616	116	98	211	105	194	324	248	121	2,987
<i>Mycteroperca microlepis</i>	.	.	.	6	.	.	2	.	.	1	.	.	9
<i>Myrophis punctatus</i>	.	.	2	2	.	1	.	1	1	1	.	.	8
<i>Negaprion brevirostris</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Notemigonus crysoleucas</i>	9	.	.	.	186	367	14	5	33	8	1	2	625
<i>Ogcocephalus cubifrons</i>	2	1	3	2	1	.	2	1	.	1	1	.	14
<i>Oligoplites saurus</i>	.	.	.	1	2	2	11	12	56	15	.	.	99
<i>Ophichthus gomesii</i>	.	.	.	.	.	.	.	.	.	1	.	.	1
<i>Ophidion marginatum</i>	.	1	.	.	.	.	.	.	.	.	.	.	1
<i>Opisthonema oglinum</i>	1	2	2	76	99	1	387	4	76	19	9	1	677
<i>Opsanus tau</i>	.	.	3	3	3	6	7	6	3	6	3	3	43
<i>Orthopristis chrysoptera</i>	.	.	2	60	247	54	156	61	38	15	3	.	636
<i>Paralichthys albigutta</i>	9	10	9	21	32	61	20	23	6	4	10	8	213

Appendix JX07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
<i>Paralichthys dentatus</i>	.	2	.	4	6	3	2	5	1	2	3	2	30
<i>Paralichthys lethostigma</i>	14	13	40	20	24	35	45	20	14	24	12	6	267
<i>Paralichthys squamilentus</i>	.	.	.	2	.	.	.	.	.	.	.	.	2
<i>Peprilus paru</i>	.	.	1	33	.	2	8	6	.	1	1	3	55
<i>Peprilus triacanthus</i>	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Poecilia latipinna</i>	.	1	4	7	.	14	8	4	.	4	39	5	86
<i>Pogonias cromis</i>	2	10	.	10	.	1	2	4	5	7	15	21	77
<i>Pomatomus saltatrix</i>	10	5	14	37	25	7	12	1	6	2	3	3	125
<i>Pomoxis nigromaculatus</i>	3	3	5	.	14	4	1	.	1	1	2	1	35
<i>Portunus</i> spp.	1	3	9	13	49	41	53	18	5	8	16	.	216
<i>Prionotus carolinus</i>	.	1	10	.	.	.	.	.	.	.	.	.	11
<i>Prionotus evolans</i>	.	.	.	.	.	.	1	.	.	2	.	.	3
<i>Prionotus scitulus</i>	.	1	4	7	9	14	9	6	1	6	2	3	62
<i>Prionotus tribulus</i>	16	20	44	28	17	12	5	2	4	6	.	2	156
<i>Rachycentron canadum</i>	.	.	.	.	.	.	.	.	1	.	.	.	1
<i>Rhinoptera bonasus</i>	.	.	1	.	.	.	198	8	.	.	.	.	207
<i>Rimapenaeus constrictus</i>	35	9	5	1	6	17	3	6	16	15	24	15	152
<i>Sardinella aurita</i>	.	.	.	.	.	.	.	.	2	.	.	.	2
<i>Sciaenidae</i> sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
<i>Sciaenops ocellatus</i>	9	6	14	27	7	3	11	18	14	46	40	33	228
<i>Scomberomorus maculatus</i>	.	.	.	8	.	3	12	5	4	.	.	1	33
<i>Selene setapinnis</i>	.	.	.	.	.	.	.	1	.	3	.	1	5
<i>Selene vomer</i>	1	.	.	.	.	8	7	5	8	37	8	1	75
<i>Sicyonia brevirostris</i>	.	2	2	1	.	.	.	.	.	.	.	.	5
<i>Sicyonia parri</i>	1	.	.	.	2	.	.	.	.	.	.	.	3
<i>Sicyonia</i> sp.	.	.	.	.	1	.	.	.	.	.	.	.	1

Appendix JX07-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
<i>Sphoeroides nephelus</i>	3	1	.	2	11	33	17	22	26	21	23	4	163
<i>Sphoeroides spengleri</i>	.	.	1	.	.	.	.	1	.	.	.	.	2
<i>Sphyraena barracuda</i>	.	.	.	.	.	.	.	.	1	1	.	.	2
<i>Sphyraena borealis</i>	.	.	1	.	4	.	.	.	.	.	.	.	5
<i>Sphyrna tiburo</i>	.	.	.	1	.	3	2	1	4	.	.	.	11
<i>Stellifer lanceolatus</i>	1	.	.	11	.	12	474	4	12	144	8	14	680
<i>Stephanolepis hispidus</i>	1	1	1	3	8	11	6	2	.	4	.	.	37
<i>Stomolophus meleagris</i>	73	275	8	5	.	.	.	.	.	.	.	2	363
<i>Strongylura marina</i>	1	35	33	14	19	20	9	18	23	9	4	4	189
<i>Strongylura notata</i>	.	.	.	.	1	.	.	.	.	.	.	.	1
<i>Strongylura spp.</i>	.	.	.	20	29	16	2	6	2	2	2	.	79
<i>Symphurus plagiusa</i>	13	6	16	12	17	21	62	14	97	97	37	8	400
<i>Syngnathus fuscus</i>	.	.	.	2	.	.	.	.	.	.	.	.	2
<i>Syngnathus louisianae</i>	1	.	1	1	5	26	8	3	.	7	3	.	55
<i>Syngnathus scovelli</i>	23	9	19	10	17	50	52	74	9	10	2	10	285
<i>Synodus foetens</i>	9	4	8	4	8	37	12	11	7	7	5	5	117
<i>Tilapia spp.</i>	.	.	.	.	.	1	9	17	1	4	.	.	32
<i>Trachinotus carolinus</i>	.	.	.	.	6	20	8	10	7	.	99	.	150
<i>Trachinotus falcatus</i>	.	2	.	.	1	10	2	.	13	11	14	9	62
<i>Trichiurus lepturus</i>	.	.	.	4	.	6	3	3	.	1	.	1	18
<i>Trinectes maculatus</i>	35	28	45	26	10	12	48	52	65	78	66	109	574
<i>Tylosurus crocodilus</i>	.	.	.	.	.	.	1	.	1	.	.	.	2
<i>Urophycis floridana</i>	.	2	.	.	.	.	.	.	.	.	.	.	2
<i>Urophycis regia</i>	.	2	1	1	.	.	.	.	.	.	.	.	4
Totals	22,249	9,772	14,884	20,637	13,491	21,749	27,785	27,550	25,822	16,547	9,764	10,778	221,028

Appendix JX07-02. Summary by gear, stratum, and zone of species collected during Northeast Florida stratified-random sampling, 2007. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192		E=1,356
<i>Abudefduf saxatilis</i>	1	.	.	.	1	.	.	.	.	1
<i>Achirus lineatus</i>	32	23	43	10	14	45	18	6	5	98
<i>Albula vulpes</i>	.	2	.	.	.	2	.	.	.	2
<i>Alosa aestivalis</i>	.	1	.	.	.	1	.	.	.	1
<i>Alosa sapidissima</i>	4	.	.	.	.	.	.	.	4	4
<i>Aluterus schoepfii</i>	.	.	1	.	.	1	.	.	.	1
<i>Ameiurus catus</i>	7	25	145	1	4	1	56	47	68	177
<i>Ameiurus nebulosus</i>	1	.	7	.	.	.	.	.	8	8
<i>Amia calva</i>	4	.	.	.	.	.	.	1	3	4
<i>Anchoa hepsetus</i>	17,770	.	570	960	563	16,576	88	151	2	18,340
<i>Anchoa lyolepis</i>	1,608	.	.	.	6	1,602	.	.	.	1,608
<i>Anchoa mitchilli</i>	62,468	.	10,997	22,349	23,461	5,996	5,883	2,749	13,027	73,465
<i>Ancylosetta quadrocellata</i>	.	13	9	4	3	15	.	.	.	22
<i>Anguilla rostrata</i>	.	.	2	.	.	1	1	.	.	2
<i>Archosargus probatocephalus</i>	20	127	48	21	38	107	18	6	5	195
<i>Ariopsis felis</i>	1	16	41	5	3	12	38	.	.	58
<i>Astroscopus y-graecum</i>	6	4	4	1	1	12	.	.	.	14
<i>Bagre marinus</i>	.	21	3	.	24	.	.	.	.	24
<i>Bairdiella chrysoura</i>	2,322	1,576	203	1,044	981	306	769	908	93	4,101
<i>Bathygobius soporator</i>	17	.	.	6	3	8	.	.	.	17
<i>Brevoortia</i> spp.	663	1,080	3	345	316	216	341	528	.	1,746
<i>Callinectes ornatus</i>	1	.	14	2	12	1	.	.	.	15
<i>Callinectes sapidus</i>	536	409	1,864	338	366	591	874	285	355	2,809
<i>Callinectes similis</i>	208	134	551	273	286	307	27	.	.	893
<i>Caranx crysos</i>	.	3	.	.	1	.	2	.	.	3
<i>Caranx hippos</i>	16	147	1	21	34	81	28	.	.	164
<i>Caranx latus</i>	1	16	.	5	.	12	.	.	.	17
<i>Centropomus undecimalis</i>	.	38	.	.	.	.	38	.	.	38
<i>Centropristis philadelphica</i>	2	6	47	37	4	11	3	.	.	55
<i>Centropristis striata</i>	.	.	4	.	3	1	.	.	.	4

Appendix JX07-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
<i>Chaetodipterus faber</i>	2	70	100	54	96	19	3	.	.	172
<i>Charybdis hellerii</i>	.	.	1	.	1	.	.	.	.	1
<i>Chasmodes bosquianus</i>	7	.	.	1	.	3	2	1	.	7
<i>Chilomycterus schoepfii</i>	25	144	25	50	36	101	7	.	.	194
<i>Chloroscombrus chrysurus</i>	30	831	130	52	61	642	236	.	.	991
<i>Citharichthys macrops</i>	3	.	.	1	.	2	.	.	.	3
<i>Citharichthys spilopterus</i>	212	272	337	130	162	195	198	61	75	821
<i>Clupeidae</i> spp.	.	.	2	1	.	.	.	1	.	2
<i>Ctenogobius boleosoma</i>	92	.	7	16	24	55	4	.	.	99
<i>Ctenogobius shufeldti</i>	28	.	7	4	1	11	7	9	3	35
<i>Ctenogobius smaragdus</i>	30	.	1	7	3	21	.	.	.	31
<i>Cynoscion nebulosus</i>	282	220	22	93	71	239	54	56	11	524
<i>Cynoscion nothus</i>	.	.	12	11	.	1	.	.	.	12
<i>Cynoscion complex</i>	13	3	604	43	80	21	180	195	101	620
<i>Cyprinodon variegatus</i>	2	.	.	.	1	1	.	.	.	2
<i>Dasyatis sabina</i>	27	967	160	236	167	465	217	30	39	1,154
<i>Dasyatis say</i>	1	25	3	7	12	10	.	.	.	29
<i>Diapterus auratus</i>	65	79	11	2	14	76	57	2	4	155
<i>Dorosoma cepedianum</i>	5	128	2	1	.	1	129	1	3	135
<i>Dorosoma petenense</i>	5,410	163	25	.	12	1	181	15	5,389	5,598
<i>Elops saurus</i>	10	520	46	13	52	85	412	8	6	576
<i>Esox niger</i>	1	.	.	.	.	.	.	1	.	1
<i>Etropus crossotus</i>	33	174	229	250	82	86	18	.	.	436
<i>Eucinostomus gula</i>	38	86	12	8	27	78	23	.	.	136
<i>Eucinostomus harengulus</i>	737	1,507	55	49	76	546	1,488	70	70	2,299
<i>Eucinostomus</i> spp.	1,647	.	21	105	547	703	264	21	28	1,668
<i>Evorthodus lyricus</i>	1	.	.	.	.	1	.	.	.	1
<i>Farfantepenaeus aztecus</i>	35	.	20	10	15	16	9	2	3	55
<i>Farfantepenaeus duorarum</i>	47	30	377	77	274	51	23	16	13	454
<i>Farfantepenaeus</i> spp.	483	1	243	110	182	226	135	72	2	727
<i>Fundulus heteroclitus</i>	2,167	.	.	537	282	1,336	12	.	.	2,167
<i>Fundulus majalis</i>	190	1	.	4	83	104	.	.	.	191

Appendix JX07-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192		E=1,356
<i>Fundulus seminolis</i>	937	7	.	.	.	.	30	211	703	944
<i>Gambusia holbrooki</i>	3,060	.	.	33	.	15	54	400	2,558	3,060
<i>Gobiesox strumosus</i>	2	.	2	.	1	1	.	2	.	4
<i>Gobiidae sp.</i>	.	.	1	.	.	1	.	.	.	1
<i>Gobioides broussonetii</i>	.	.	19	.	.	5	10	4	.	19
<i>Gobionellus oceanicus</i>	4	.	15	1	.	8	4	6	.	19
<i>Gobiosoma bosc</i>	236	.	26	14	12	52	41	41	102	262
<i>Gobiosoma robustum</i>	51	.	9	7	2	10	7	12	22	60
<i>Gobiosoma spp.</i>	404	.	47	1	.	13	39	43	355	451
<i>Gymnura micrura</i>	.	75	17	16	66	10	.	.	.	92
<i>Harengula jaguana</i>	7	36	.	.	33	10	.	.	.	43
<i>Heterandria formosa</i>	174	.	.	.	.	.	3	40	131	174
<i>Hippocampus erectus</i>	.	.	2	1	.	1	.	.	.	2
<i>Histrio histrio</i>	.	1	.	1	.	.	.	.	.	1
<i>Hypoleurochilus geminatus</i>	1	.	.	.	.	1	.	.	.	1
<i>Hypsoblennius hentz</i>	2	.	1	1	1	1	.	.	.	3
<i>Ictalurus punctatus</i>	1	5	20	.	.	.	5	5	16	26
<i>Jordanella floridae</i>	2	.	.	.	.	.	.	2	.	2
<i>Labidesthes sicculus</i>	8	.	.	.	.	.	6	2	.	8
<i>Lactophrys trigonus</i>	1	.	.	.	1	.	.	.	.	1
<i>Lagodon rhomboides</i>	1,144	1,805	106	140	58	752	1,515	582	8	3,055
<i>Larimus fasciatus</i>	.	.	2	2	.	.	.	.	.	2
<i>Leiostomus xanthurus</i>	5,131	2,024	1,729	1,515	744	2,467	3,067	726	365	8,884
<i>Lepisosteus osseus</i>	10	77	4	32	21	1	30	1	6	91
<i>Lepisosteus platyrhincus</i>	15	4	2	.	.	.	4	13	4	21
<i>Lepomis auritus</i>	73	96	17	.	.	.	122	8	56	186
<i>Lepomis gulosus</i>	10	.	.	.	.	1	.	8	1	10
<i>Lepomis macrochirus</i>	675	168	69	.	.	2	207	153	550	912
<i>Lepomis microlophus</i>	83	74	42	.	.	.	85	52	62	199
<i>Lepomis punctatus</i>	5	.	1	.	.	.	.	1	5	6
<i>Lepomis spp.</i>	245	.	.	.	.	1	.	43	201	245
<i>Limulus polyphemus</i>	.	3	11	8	4	2	.	.	.	14

Appendix JX07-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192		E=1,356
<i>Litopenaeus setiferus</i>	4,910	859	1,601	1,197	2,947	1,902	694	423	207	7,370
<i>Lobotes surinamensis</i>	1	5	.	3	3	.	.	.	.	6
<i>Loricariidae</i> sp.	1	.	.	.	.	.	.	.	1	1
<i>Lucania goodei</i>	252	.	.	.	.	.	9	43	200	252
<i>Lucania parva</i>	14,717	.	1	.	.	.	595	5,478	8,645	14,718
<i>Lutjanus griseus</i>	27	22	13	9	12	13	17	8	3	62
<i>Lutjanus synagris</i>	10	4	10	1	11	12	.	.	.	24
<i>Membras martinica</i>	2,391	.	.	980	30	1,369	.	.	12	2,391
<i>Menidia menidia</i>	13,121	.	1	5,151	3,036	4,822	113	.	.	13,122
<i>Menidia</i> spp.	9,924	.	1	35	10	45	747	1,726	7,362	9,925
<i>Menippe</i> spp.	.	1	9	6	1	3	.	.	.	10
<i>Menticirrhus americanus</i>	55	106	127	78	120	58	30	2	.	288
<i>Menticirrhus littoralis</i>	.	1	.	.	1	.	.	.	.	1
<i>Menticirrhus saxatilis</i>	5	.	6	1	3	5	2	.	.	11
<i>Microgobius gulosus</i>	328	.	344	.	.	1	60	226	385	672
<i>Microgobius thalassinus</i>	29	.	160	4	1	38	121	24	1	189
<i>Microphis brachyurus</i>	5	.	.	4	.	.	1	.	.	5
<i>Micropogonias undulatus</i>	938	407	12,287	346	279	1,037	5,236	1,430	5,304	13,632
<i>Micropterus salmoides</i>	483	15	3	.	.	.	34	247	220	501
<i>Morone saxatilis</i>	2	.	.	.	.	.	.	.	2	2
<i>Mugil cephalus</i>	2,158	3,319	1	648	1,992	1,241	1,123	261	213	5,478
<i>Mugil curema</i>	192	2,795	.	135	309	1,060	1,460	7	16	2,987
<i>Mycteroperca microlepis</i>	8	.	1	.	2	7	.	.	.	9
<i>Myrophis punctatus</i>	3	.	5	1	3	1	1	.	2	8
<i>Negaprion brevirostris</i>	.	1	.	1	.	.	.	.	.	1
<i>Notemigonus crysoleucas</i>	625	.	.	.	.	.	.	237	388	625
<i>Ogcocephalus cubifrons</i>	.	3	11	7	2	5	.	.	.	14
<i>Oligoplites saurus</i>	91	7	1	53	2	15	22	7	.	99
<i>Ophichthus gomesii</i>	.	.	1	.	.	1	.	.	.	1
<i>Ophidion marginatum</i>	.	.	1	.	1	.	.	.	.	1
<i>Opisthonema oglinum</i>	455	221	1	85	104	479	8	1	.	677
<i>Opsanus tau</i>	9	3	31	11	11	20	1	.	.	43

Appendix JX07-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192		E=1,356
<i>Orthopristis chrysoptera</i>	456	63	117	29	111	105	228	163	.	636
<i>Paralichthys albigutta</i>	54	121	38	56	28	99	30	.	.	213
<i>Paralichthys dentatus</i>	7	10	13	12	9	8	1	.	.	30
<i>Paralichthys lethostigma</i>	73	85	109	41	42	65	54	30	35	267
<i>Paralichthys squamilentus</i>	1	1	.	.	.	2	.	.	.	2
<i>Pepilus paru</i>	.	48	7	47	3	5	.	.	.	55
<i>Pepilus triacanthus</i>	.	.	1	1	.	.	.	.	.	1
<i>Poecilia latipinna</i>	86	.	.	2	1	3	.	4	76	86
<i>Pogonias cromis</i>	16	35	26	2	38	32	5	.	.	77
<i>Pomatomus saltatrix</i>	14	111	.	68	20	37	.	.	.	125
<i>Pomoxis nigromaculatus</i>	18	.	17	.	.	.	1	9	25	35
<i>Portunus</i> spp.	62	15	139	87	49	80	.	.	.	216
<i>Prionotus carolinus</i>	.	.	11	9	2	.	.	.	.	11
<i>Prionotus evolans</i>	.	2	1	1	2	.	.	.	.	3
<i>Prionotus scitulus</i>	16	7	39	26	13	22	1	.	.	62
<i>Prionotus tribulus</i>	23	46	87	32	54	53	17	.	.	156
<i>Rachycentron canadum</i>	.	1	.	.	.	1	.	.	.	1
<i>Rhinoptera bonasus</i>	.	207	.	7	200	.	.	.	.	207
<i>Rimopenaeus constrictus</i>	1	.	151	85	38	28	1	.	.	152
<i>Sardinella aurita</i>	2	.	.	.	.	2	.	.	.	2
<i>Sciaenidae</i> sp.	.	.	1	.	1	.	.	.	.	1
<i>Sciaenops ocellatus</i>	139	88	1	12	9	111	57	32	7	228
<i>Scomberomorus maculatus</i>	4	29	.	9	10	13	1	.	.	33
<i>Selene setapinnis</i>	.	.	5	3	.	2	.	.	.	5
<i>Selene vomer</i>	2	65	8	15	14	44	2	.	.	75
<i>Sicyonia brevirostris</i>	.	.	5	3	.	2	.	.	.	5
<i>Sicyonia parri</i>	1	.	2	1	1	1	.	.	.	3
<i>Sicyonia</i> sp.	.	.	1	1	.	.	.	.	.	1
<i>Sphoeroides nephelus</i>	58	71	34	10	33	95	22	3	.	163
<i>Sphoeroides spengleri</i>	.	.	2	.	.	2	.	.	.	2
<i>Sphyraena barracuda</i>	1	1	.	.	2	.	.	.	.	2
<i>Sphyraena borealis</i>	5	.	.	.	4	1	.	.	.	5

Appendix JX07-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192		E=1,356
<i>Sphyrna tiburo</i>	.	11	.	9	2	.	.	.	.	11
<i>Stellifer lanceolatus</i>	.	12	668	197	461	3	19	.	.	680
<i>Stephanolepis hispidus</i>	17	2	18	9	12	15	1	.	.	37
<i>Stomolophus meleagris</i>	9	326	28	46	33	284	.	.	.	363
<i>Strongylura marina</i>	43	146	.	8	15	110	19	19	18	189
<i>Strongylura notata</i>	.	1	.	.	.	1	.	.	.	1
<i>Strongylura</i> spp.	79	.	.	2	11	5	14	23	24	79
<i>Symphurus plagiusa</i>	198	2	200	130	156	95	19	.	.	400
<i>Syngnathus fuscus</i>	.	.	2	.	.	1	1	.	.	2
<i>Syngnathus louisianae</i>	38	.	17	5	20	13	4	13	.	55
<i>Syngnathus scovelli</i>	275	.	10	4	1	5	17	180	78	285
<i>Synodus foetens</i>	48	18	51	23	22	60	11	1	.	117
<i>Tilapia</i> spp.	32	.	.	.	.	.	.	.	32	32
<i>Trachinotus carolinus</i>	137	13	.	15	12	123	.	.	.	150
<i>Trachinotus falcatus</i>	27	35	.	9	25	24	4	.	.	62
<i>Trichiurus lepturus</i>	.	3	15	2	6	10	.	.	.	18
<i>Trinectes maculatus</i>	49	7	518	63	14	8	197	141	151	574
<i>Tylosurus crocodilus</i>	1	1	.	.	.	2	.	.	.	2
<i>Urophycis floridana</i>	.	.	2	.	2	.	.	.	.	2
<i>Urophycis regia</i>	.	.	4	2	2	.	.	.	.	4
Totals	162,324	22,589	36,115	38,905	39,786	48,061	28,072	18,335	47,869	221,028

Directed Sampling

Introduction

The Fisheries-Independent Monitoring program conducted seasonal directed sampling for striped mullet (*Mugil cephalus*) in Tampa Bay and Charlotte Harbor. Data obtained from directed sampling were used cooperatively by a number of Fish and Wildlife Research Institute research groups (i.e., Fisheries Assessment and Fish Biology) to provide stock assessments on this species. The objectives of this directed sampling research were to determine the size, age, and sex composition of localized populations of striped mullet in select Florida estuaries. This report summarizes data collected from January 1 – March 14, 2007 and from September 15 – December 31, 2007. For length frequency analyses, striped mullet data collected during winter 2007 (January 1 – March 14, 2007) were combined with data from fall 2006 (September 15, 2006 – December 31, 2006) to form the 2006/2007 mullet season. Fall 2007 striped mullet data are presented separately.

Methods

Tampa Bay. Directed sampling for striped mullet during 2007 was conducted in Tampa Bay using a 366-m monofilament trammel net with 308-mm stretch outer mesh and 71-mm stretch inner mesh. The net was set on visually-detected schools of striped mullet in water <3 m deep. Sampling was divided into three winter 4-week sampling periods (December 15, 2006 – January 14, 2007; January 15 – February 14, and February 15 – March 14) and three fall 4-week sampling periods (September 15 – October 14, October 15 – November 14, November 15 – December 14, 2007), with at least two days of sampling conducted within each period unless the three criteria stated in the proposal were achieved (i.e., the date was later than February 15, at least 1,600 striped mullet were collected, and the number of sampling trips was greater than or equal to six).

The study universe was divided into six sampling areas (Figure DR07-01). During each sampling period, two primary and two secondary sampling areas were assigned (one primary and one secondary area on the east and west sides of the bay) from the six possible sampling

areas. Primary sampling areas were searched for a maximum of two hours or until at least 200 striped mullet had been measured and 50 fish were culled (returned to the laboratory for age and sex determination). Secondary areas were sampled only if the minimum number of striped mullet were not collected in the primary areas. Additional sampling days were added as necessary to procure the required amount of culled (100 fish) and measured (400 fish) striped mullet per sampling window. To increase the probability of successful collections, primary areas were non-randomly selected because striped mullet were generally found in the northern reaches of estuaries prior to the spawning season and moved south to the mouth of the bay as the spawning season progressed. Therefore, sampling was directed toward northern areas of Tampa Bay early in the season and shifted to southern Tampa Bay later in the season.

For length frequency analysis on fall 2006/winter 2007 data, striped mullet data collected during winter 2007 were combined with data from fall of the previous year to form the 2006/2007 mullet season. Fall 2007 striped mullet data are presented separately.

Charlotte Harbor. A similar sampling design and collection method was used in Charlotte Harbor. The sampling was divided into two winter 4-week sampling periods (December 15, 2006 – January 14, 2007 and January 15 – February 14) and two fall 4-week sampling periods (October 15 – November 14, November 15 – December 14).

The study universe was divided into four sampling areas (Figure DR07-02). During each sampling window, two primary and two secondary sampling areas were assigned (one primary and one secondary area on the north and south sides of the harbor) from the four possible sampling areas. Additional sampling days were added as necessary to procure the required amount of culled (160 fish) and measured (400 fish) striped mullet per sampling period.

For length frequency analysis on fall 2006/winter 2007 data, striped mullet data collected during winter 2007 were combined with data from fall of the previous year to form the 2006/2007 mullet season. Fall 2007 striped mullet data are presented separately.

Results and Discussion

Tampa Bay. A total of 3,901 striped mullet were collected during 18 sampling trips (67 hauls) in 2007 (Table DR07-01). For the fall 2007 season, a total of 2,003 striped mullet were collected from 8 trips and 36 hauls. The greatest number of striped mullet (n=572, 28.6% of total striped mullet caught in fall 2007) were collected in the East/North area, and the fewest striped mullet (n=193, 9.6% of the total striped mullet catch in fall 2007) were collected in the

East/South area (Table DR07-02). Striped mullet lengths during the fall 2007 season ranged from 216 to 512 mm fork length (Figure DR07-03).

Charlotte Harbor. A total of 1,731 striped mullet were collected during 14 sampling trips (37 hauls) in 2007 (Table DR07-01). For the fall 2007 season, a total of 1,181 striped mullet were collected from 8 trips and 23 hauls. The greatest number of striped mullet (n=567, 48.0% of total striped mullet caught in fall 2007) were collected in the North/West area and the fewest striped mullet (n=121, 10.2% of the total striped mullet catch in fall 2007) were collected in the North/East area (Table DR07-02). Striped mullet lengths during the fall 2007 season ranged from 219 to 506 mm fork length (Figure DR07-03). No sampling events occurred January 1 – 14, 2007, because sampling was complete for the December 15, 2006 – January 14, 2007, sampling period prior to January 1, 2007.

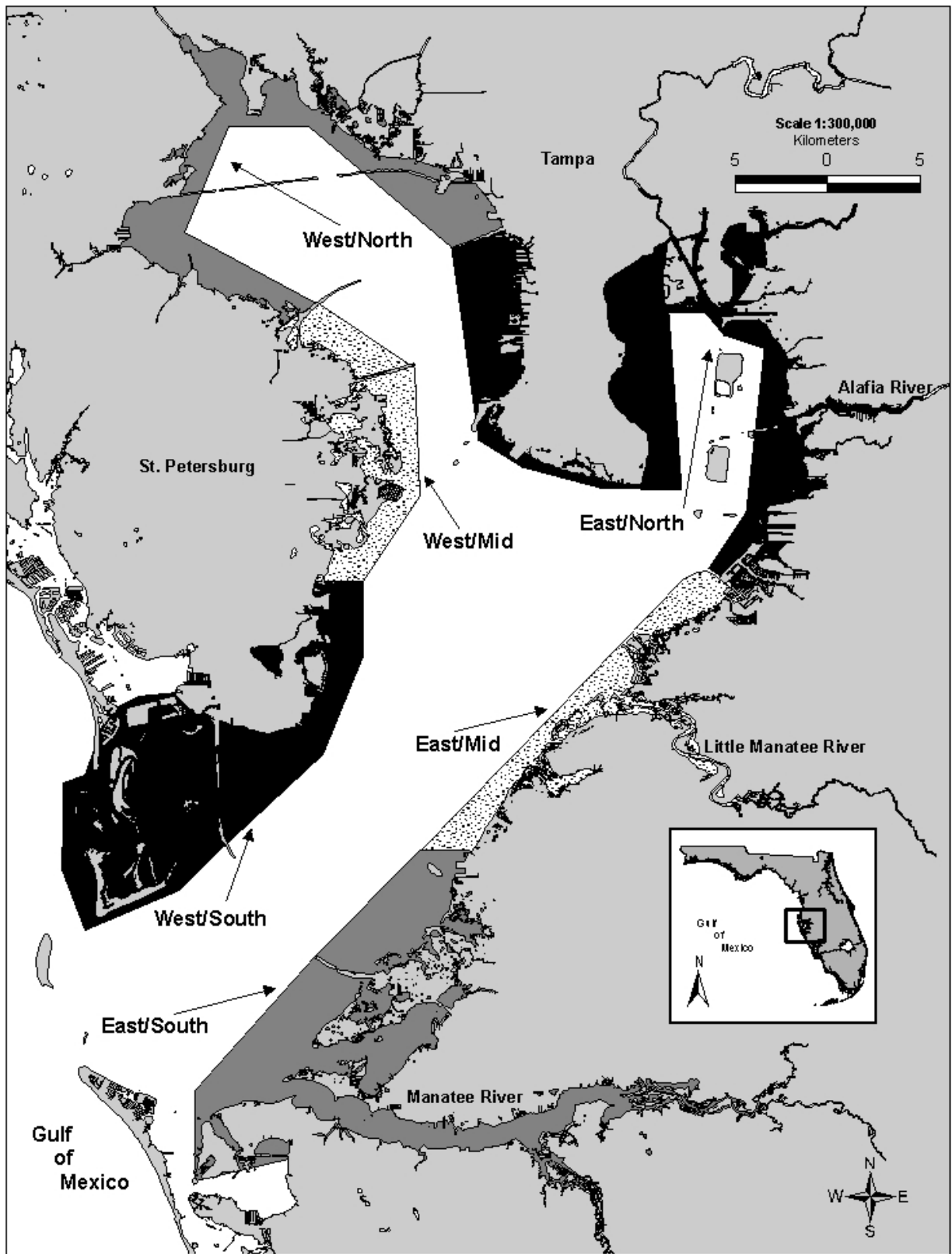


Figure DR07-01. Map of the 6 striped mullet sampling areas in Tampa Bay.

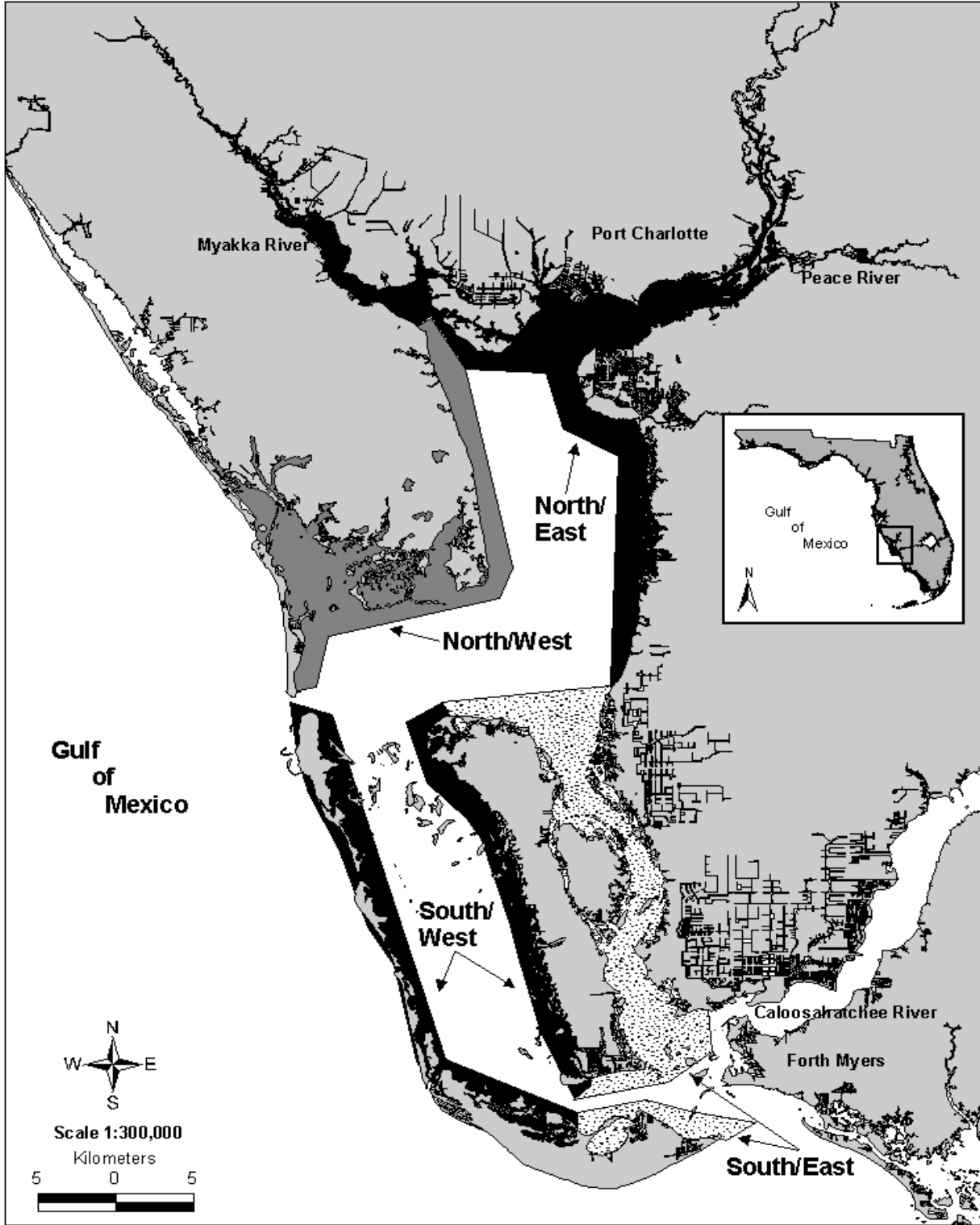


Figure DR07-02. Map of the 4 striped mullet sampling areas in Charlotte Harbor.

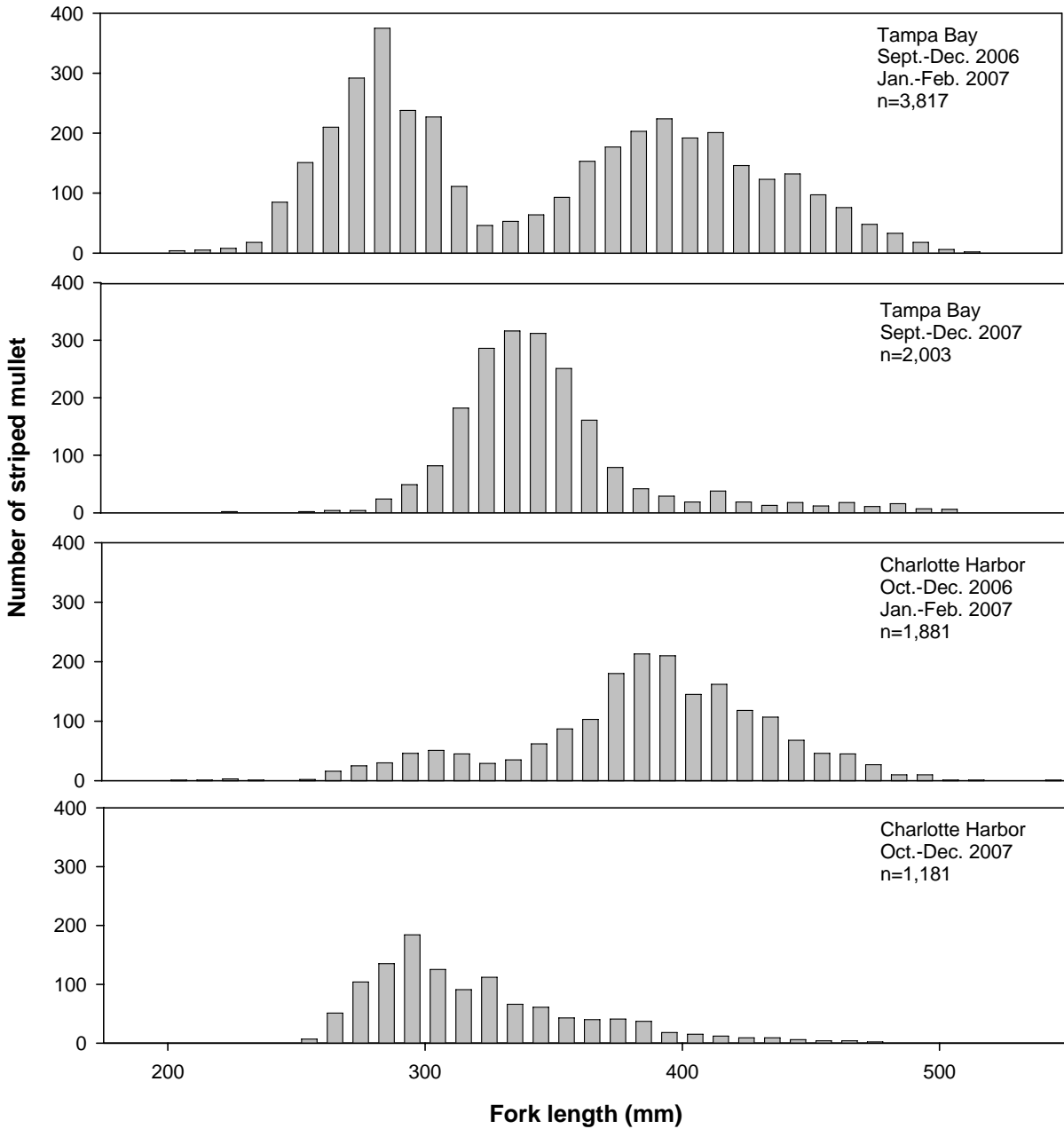


Figure DR07-03. Size distributions of striped mullet collected during trammel net surveys in Tampa Bay and Charlotte Harbor, 2006-2007. The 2006/07 graphs represent striped mullet collected from September 2006 to February 2007. The 2007 graphs represent striped mullet collected from September 2007 to December 2007 for Tampa Bay, and October 2007 to December 2007 for Charlotte Harbor.

Table DR07-01. Summary of effort and catch data for directed striped mullet sampling in Tampa Bay and Charlotte Harbor, 2007 calendar year. Number of Trips denotes the number of sampling events that occurred in the sampling period.

Sampling Period	Tampa Bay			Charlotte Harbor		
	No. of Trips	No. of Hauls	No. of Mullet	No. of Trips	No. of Hauls	No. of Mullet
January 1 – 14*	2	8	408	0	0	0
January 15 – February 14*	8	23	1,490	6	14	550
February 15-March 14*	-	-	-	-	-	-
September 15 – October 14	2	16	428	-	-	-
October 15 – November 14	2	7	558	3	9	434
November 15 – December 14	2	6	583	3	9	439
December 15 – 31	2	7	434	2	5	308
Sub-Total (January – February)	10	31	1,898	6	14	550
Sub-Total (September – December)	8	36	2,003	8	23	1,181
Grand Total (2007 Calendar Year)	18	67	3,901	14	37	1,731

* Fish collected in January – March, 2007 were treated as part of the 2006/2007 sampling season.

Table DR07-02. Striped mullet sampling and capture locations in Tampa Bay and Charlotte Harbor, fall 2007. The six sampling areas in Tampa Bay and the four in Charlotte Harbor are defined below. Number of Trips denotes the number of times the sampling areas were visited. On occasion, two sampling areas were visited in one trip (noted by *).

Bay	Sampling Area	No. of Trips	No. of Hauls	No. of Striped Mullet
Tampa Bay	West/North: Old Tampa Bay south to Howard Franklin Bridge	2	13	414
	West/Mid: Howard Franklin Bridge south to St. Pete Pier	1	3	360
	West/South: St. Pete Pier south to Mullet Key	1	4	241
	East/North: Hillsborough Bay south to Apollo Beach	2	10	572
	East/Mid: Apollo Beach south to Piney Point	1	3	223
	East/South: Piney Point south to Manatee River	1	3	193
Charlotte Harbor	North/East: Myakka River south to Burnt Store	2	4	121
	North/West: Bull Bay/Turtle Bay	4*	11	567
	South/East: Burnt Store south to Matlacha Pass	2*	5	358
	South/West: South of Boca Grande Pass, including Pine Island Sound to York Island	2	3	135

Charlotte Harbor One sampling trips visited the South/East and South/West sampling areas. Also, one sampling trip visited the North/West and South/West sampling areas.

Fish Health Monitoring

Introduction

The long-term multi-gear and multi-habitat sampling approach of the Fisheries-Independent Monitoring (FIM) program not only provides fish population information to fisheries managers, but also helps document changes and evaluates the effects of natural and anthropogenic disturbances to ecosystems (Wolfe et al. 1987). Increased urban development in coastal areas has made adjacent aquatic ecosystems (estuaries, bays, and tidal rivers) some of the most intensively fertilized environments on earth (Cloern et al. 1995). The influx of nutrients and other materials commonly associated with urban development and industry has led to concerns about the concomitant eutrophication and degradation of water quality in Florida's coastal systems. Evidence of a correlation between environmental degradation and the occurrence of certain fish diseases continues to accumulate (Sinderman 1979). The incidence of gross external abnormalities (GEAs) in marine species, defined as those illnesses or deformations easily observed in the field, provides valuable information on the level of environmental stress placed upon species in estuarine and coastal waters (Fournie et al. 1996). Baseline information on the frequency of occurrence of GEAs is necessary to identify changes in the ecological health of Florida's estuaries.

In April 1998, the Fish and Wildlife Research Institute's (FWRI) FIM program began to document visually observed GEAs (including parasites) on fish and select invertebrates in Florida's estuaries. The main objectives of the fish health monitoring component of the FIM program are to categorize prominent types of GEAs observed, document which species are most susceptible, and document normal background levels of fish health problems. This report summarizes the occurrence of GEAs observed on larger (≥ 75 mm SL) fish and select macro-invertebrates collected during routine SRS in select Florida estuaries from January through December 2007.

Methods

Fish health monitoring was conducted in all Florida estuarine areas sampled by the FIM program. All specimens ≥ 75 mm SL were visually examined for GEAs. Fish < 75 mm SL that were opportunistically observed with abnormalities were also recorded;

however, they are not presented in this report. Specimens with external abnormalities were assigned a “Health Code” in the field by FIM staff, packed on ice and returned to the lab. These specimens were sent to the FWRI’s Fish and Wildlife Health (FWH) group in St. Petersburg, Florida, for detailed diagnosis. Specimens collected from estuaries outside the Tampa Bay region were either fixed in 10% formalin or shipped on ice to the FWH group. After evaluating each specimen, the FWH group assigned a health code to each specimen and provided these data to the FIM program for input into a database. Health codes assigned by the fish pathologists in the FWH group took priority over those assigned in the field. For specimens that were assigned a health code and released in the field (i.e., fish with scoliosis) the health codes were not changed. Nine health codes were used:

- B Red or bloody areas (no scale loss)
- E Erosion or scale loss (only epidermis or dermis involved, muscle tissue not affected)
- F Fin rot (inflamed or frayed fins)
- S Skeletal abnormalities (vertebral, opercular, or fin deformities)
- T Tumor, cyst (raised area)
- U Ulcer or lesion (muscle tissue affected)
- P Parasitic infestation
- D Dead prior to collection
- O Other (i.e., emaciated fish, healing wound, eye discoloration, missing parts, and mechanical damage)

Results and Discussion

Of the 315,983 fish (≥ 75 mm SL) and select macro-invertebrates that were collected during 2007 FIM SRS, 413 (30 taxa, 0.13%) were observed to have a GEA (Table FH07-01). Statewide, all nine types of GEAs were observed. The most often identified GEA were parasitic infestations ($n=306$), followed by skeletal abnormalities ($n=36$) and ulcers or lesions ($n=30$). Charlotte Harbor had the highest GEA incidence (0.38%), while Northeast Florida (0.01%) and Apalachicola (0.01%) had the lowest incidence. Six taxa of recreational or commercial importance (i.e., Selected Taxa) were among the top 10 taxa observed with a GEA (Table FH07-02). *Callinectes sapidus* was the most common species collected with a GEA and all affected crabs were parasitized by *Loxothylacus texanus*, except three which were found dead. *Lagodon rhomboides* was the most common fish collected with a GEA with most having some skeletal abnormality.

Incidence by Lab

Apalachicola Bay: Apalachicola Bay staff examined 52,249 specimens for GEAs. Seven individuals (0.01%) from five taxa, four of which were Selected Taxa, had a GEA (Table FH07-03). This region had the lowest incidence of GEAs in the state. Skeletal abnormalities ($n = 4$), ulcers or lesions ($n = 2$), and bloody areas ($n=1$) were the only GEAs observed.

Cedar Key: Cedar Key staff examined 35,338 specimens for GEAs. Seven individuals (0.02%) from six taxa had a GEA (Table FH07-04). Four of the six taxa with a GEA were Selected Taxa. Two specimens were found dead, while all other affected specimens had either an ulcer or lesion, fin rot, or a parasitic infestation. All six taxa had low percentages of affected specimens with a GEA (all $< 0.5\%$ affected).

Charlotte Harbor: Charlotte Harbor staff examined 77,728 specimens for GEAs. Two hundred ninety-nine individuals (0.38%) from 12 taxa, five of which were Selected Taxa, had a GEA (Table FH07-05). This was the highest incidence of GEAs in the state. *Callinectes sapidus* was the most common species collected with a GEA and all but one affected crab were parasitized by *Loxothylacus texanus*. All affected *Lagodon*

rhomboides had some form of skeletal abnormality (n=20). All health codes except tumors/cysts, and 'other' were observed.

Northern Indian River Lagoon: Northern Indian River Lagoon staff examined 39,669 specimens for GEAs. Eleven individuals (0.03%) from six taxa, three of which were Selected Taxa, had a GEA (Table FH07-06). The most common GEA observed on the 11 afflicted fish collected in this region was 'other' (n=3) while parasitic infestations, ulcers or lesions, erosion or scale loss, and tumors/cysts were recorded twice each.

Northeast Florida: Northeast Florida staff examined 28,740 specimens for GEAs. Three individuals (0.01%) from three taxa, one of which was Selected Taxa, had a GEA (Table FH07-07). This region also had the lowest incidence of GEAs in the state. The only GEAs observed from this region were ulcers or lesions (n=2) and 'other' (n=1).

Tampa Bay: Tampa Bay staff examined 61,816 specimens for GEAs. Fifty-seven individuals (0.09%) from 16 taxa, eight of which were Selected Taxa, had a GEA (Table FH07-08). Thirty-six of the 57 GEAs observed were identified as parasitic infestations. All GEAs were observed from this region except bloody areas and erosion or scale loss.

Southern Indian River Lagoon: Southern Indian River Lagoon staff examined 20,443 specimens for GEAs. Twenty-nine individuals (0.14%) from 11 taxa, six of which were Selected Taxa, had a GEA (Table FH07-09). The most commonly seen GEA in this region was ulcers or lesions (n=12), followed by fin rot (n=7).

References

- Cloern, J. E., C. Grenz, and L. Videgar-Lucas. 1995. An empirical model of the phytoplankton chlorophyll/carbon ratio—the conversion factor between productivity and growth rate. *Limnology and Oceanography* 40: 1313-1321.
- Fournie, J. W., J.K. Summers, and S.B. Weisberg. 1996. Prevalence of gross pathological abnormalities in estuarine fishes. *Transactions of the American Fisheries Society* 125: 581-590.
- Sinderman, C. J. 1979. Pollution-associated diseases and abnormalities of fish and shellfish: a review. *Fishery Bulletin* 76: 717-749.
- Wolfe, D. A., M. A. Champ, D. A. Flemer, and A. J. Mearns. 1987. Long-term biological data sets: their role in research, monitoring, and management of estuarine and coastal marine systems. *Estuaries* 10: 181-193.

Table FH07-01.

Incidence of external abnormalities in fish and selected invertebrates collected during stratified-random sampling at each FIM field lab during 2007. Data are based only on fish ≥ 75 mm SL and include total number collected, number affected by abnormalities, and percentage affected by abnormalities.

Field Laboratory	Number Collected	Number Affected	Percent Affected
Apalachicola Bay	52,249	7	0.01
Cedar Key	35,338	7	0.02
Charlotte Harbor	77,728	299	0.38
N. Indian River Lagoon	39,669	11	0.03
Northeast Florida	28,740	3	0.01
Tampa Bay	61,816	57	0.09
S. Indian River Lagoon	20,443	29	0.14
Totals	315,983	413	0.13

Table FH07-02. Top 10 taxa having gross external abnormalities collected from all estuaries sampled by the Fisheries-Independent Monitoring program during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Callinectes sapidus</i>	2,617	289	286	.	.	.	.	.	.	.	3	24.38
<i>Lagodon rhomboides</i>	72,728	24	.	.	1	2	.	20	.	1	.	0.1
<i>Mugil cephalus</i>	7,510	13	.	2	3	2	1	.	.	5	.	2.12
<i>Mugil curema</i>	4,368	12	.	1	5	4	1	.	.	1	.	1.18
<i>Centropomus undecimalis</i>	3,112	8	.	.	.	5	1	1	.	1	.	1.02
<i>Menticirrhus americanus</i>	312	6	1	.	1	2	.	1	.	1	.	11.2
<i>Strongylura notata</i>	1,572	6	.	.	.	1	.	2	3	.	.	2.09
<i>Archosargus probatocephalus</i>	1,394	5	.	.	.	2	.	3	.	.	.	1.24
<i>Brevoortia spp.</i>	2,348	5	4	.	.	1	.	.	.	.	.	0.41
<i>Ariopsis felis</i>	6,087	4	.	1	1	1	.	.	.	.	1	0.26
Totals	102,048	372	291	4	11	20	3	27	3	9	4	0.36
All others	213,935	41	15	3	1	10	0	9	0	2	1	0.02
Totals (all taxa)	315,983	413	306	7	12	30	3	36	3	11	5	0.13

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Table FH07-03. Alphabetical list of taxa having gross external abnormalities collected in Apalachicola Bay during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Archosargus probatocephalus</i>	187	1	.	.	.	.	.	1	.	.	.	0.53
<i>Elops saurus</i>	389	1	.	.	.	1	.	.	.	.	.	0.26
<i>Micropogonias undulatus</i>	3,768	3	.	1	.	.	.	2	.	.	.	0.08
<i>Sciaenops ocellatus</i>	522	1	.	.	.	1	.	.	.	.	.	0.19
<i>Strongylura marina</i>	176	1	.	.	.	.	.	1	.	.	.	0.57
Totals (all taxa)	52,249	7	.	1	.	2	.	4	.	.	.	0.01

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Table FH07-04. Alphabetical list of taxa having gross external abnormalities collected in Cedar Key during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Ariopsis felis</i>	1,417	2	.	.	1	.	.	.	.	.	1	0.14
<i>Callinectes sapidus</i>	480	1	.	.	.	.	.	.	.	.	1	0.21
<i>Menticirrhus americanus</i>	208	1	.	.	.	1	.	.	.	.	.	0.48
<i>Mugil cephalus</i>	2,451	1	.	.	.	1	.	.	.	.	.	0.04
<i>Mugil curema</i>	384	1	.	.	.	1	.	.	.	.	.	0.26
<i>Rhinoptera bonasus</i>	239	1	1	.	.	.	.	.	.	.	.	0.42
Totals (all taxa)	35,338	7	1	.	1	3	.	.	.	.	2	0.02

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Table FH07-05. Alphabetical list of taxa having gross external abnormalities collected in Charlotte Harbor during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Ariopsis felis</i>	1,156	1	.	1	.	.	.	.	.	.	.	0.09
<i>Callinectes ornatus</i>	61	3	3	.	.	.	.	.	.	.	.	4.92
<i>Callinectes sapidus</i>	1,228	263	262	.	.	.	.	.	.	.	1	21.42
<i>Centropomus undecimalis</i>	913	2	.	.	.	1	1	.	.	.	.	0.22
<i>Chaetodipterus faber</i>	264	1	.	.	.	1	.	.	.	.	.	0.38
<i>Dasyatis sabina</i>	169	1	.	.	.	.	.	.	.	.	1	0.59
<i>Lagodon rhomboides</i>	43,154	20	.	.	.	.	.	20	.	.	.	0.05
<i>Mugil cephalus</i>	202	2	.	.	2	.	.	.	.	.	.	0.99
<i>Mugil gyrans</i>	180	1	.	.	.	1	.	.	.	.	.	0.56
<i>Nicholsina usta</i>	1,655	1	.	.	.	1	.	.	.	.	.	0.06
<i>Orthopristis chrysoptera</i>	2,172	3	.	.	.	.	.	3	.	.	.	0.14
<i>Sciaenops ocellatus</i>	210	1	.	.	.	.	.	1	.	.	.	0.48
Totals (all taxa)	77,728	299	265	1	2	4	1	24	.	.	2	0.38

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Table FH07-06. Alphabetical list of taxa having gross external abnormalities collected in the northern Indian River Lagoon during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Ariopsis felis</i>	3,514	1	.	.	.	1	.	.	.	.	.	0.03
<i>Centropomus undecimalis</i>	542	1	.	.	.	.	.	.	.	1	.	0.18
<i>Hyporhamphus meeki</i>	66	2	2	.	.	.	.	.	.	.	.	3.03
<i>Mugil cephalus</i>	3,044	2	.	.	.	.	1	.	.	1	.	0.07
<i>Mugil curema</i>	3,014	3	.	.	.	1	1	.	.	1	.	0.10
<i>Strongylura notata</i>	606	2	.	.	.	.	.	.	2	.	.	0.33
Totals (all taxa)	39,669	11	2	.	.	2	2	.	2	3	.	0.03

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Table FH07-07. Alphabetical list of taxa having gross external abnormalities collected in northeast Florida during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Brevoortia spp.</i>	1,087	1	.	.	.	1	.	.	.	.	.	0.09
<i>Sciaenops ocellatus</i>	110	1	.	.	.	1	.	.	.	.	.	0.91
<i>Sphoeroides nephelus</i>	91	1	.	.	.	.	.	.	.	1	.	1.10
Totals (all taxa)	28,740	3	.	.	.	2	.	.	.	1	.	0.01

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Table FH07-08. Alphabetical list of taxa having gross external abnormalities collected in Tampa Bay during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Archosargus probatocephalus</i>	536	3	.	.	.	1	.	2	.	.	.	0.56
<i>Brevoortia spp.</i>	1,261	4	4	.	.	.	.	.	.	.	.	0.32
<i>Callinectes sapidus</i>	909	25	24	.	.	.	.	.	.	.	1	2.75
<i>Centropomus undecimalis</i>	1,093	3	.	.	.	2	.	1	.	.	.	0.27
<i>Chilomycterus schoepfii</i>	271	1	1	.	.	.	.	.	.	.	.	0.37
<i>Eucinostomus gula</i>	7,250	2	1	.	1	.	.	.	.	.	.	0.03
<i>Eucinostomus harengulus</i>	6,686	1	.	.	.	.	.	.	.	1	.	0.01
<i>Lagodon rhomboides</i>	24,729	2	.	.	1	.	.	.	.	1	.	0.01
<i>Leiostomus xanthurus</i>	723	2	1	.	.	.	.	1	.	.	.	0.28
<i>Lepisosteus osseus</i>	12	3	3	.	.	.	.	.	.	.	.	25.00
<i>Menticirrhus americanus</i>	74	3	1	.	.	.	.	1	.	1	.	4.05
<i>Mugil cephalus</i>	1,061	1	.	.	.	.	.	.	.	1	.	0.09
<i>Mugil gyrans</i>	383	1	.	.	.	1	.	.	.	.	.	0.26
<i>Mugil spp.</i>	1	1	.	.	.	.	.	1	.	.	.	100.00
<i>Sciaenops ocellatus</i>	181	1	1	.	.	.	.	.	.	.	.	0.55
<i>Strongylura marina</i>	132	1	.	.	.	1	.	.	.	.	.	0.76
<i>Strongylura notata</i>	896	3	.	.	.	.	.	2	1	.	.	0.33
Totals (all taxa)	61,816	57	36	.	2	5	.	8	1	4	1	0.09

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Table FH07-09. Alphabetical list of taxa having gross external abnormalities collected in southern Indian River Lagoon during stratified-random sampling, 2007. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = number affected / number collected * 100.

Scientific Name	Number Collected (≥75-mm SL)	Number Affected (≥75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
<i>Archosargus probatocephalus</i>	671	1	.	.	.	1	.	.	.	.	.	0.15
<i>Caranx hippos</i>	157	1	1	.	.	.	.	.	.	.	.	0.64
<i>Centropomus undecimalis</i>	564	2	.	.	.	2	.	.	.	.	.	0.35
<i>Chilomycterus schoepfii</i>	140	1	1	.	.	.	.	.	.	.	.	0.71
<i>Diapterus auratus</i>	4,851	3	.	1	.	2	.	.	.	.	.	0.06
<i>Lagodon rhomboides</i>	4,845	2	.	.	.	2	.	.	.	.	.	0.04
<i>Menticirrhus americanus</i>	30	2	.	.	1	1	.	.	.	.	.	6.67
<i>Micropogonias undulatus</i>	254	1	.	1	.	.	.	.	.	.	.	0.39
<i>Mugil cephalus</i>	752	7	.	2	1	1	.	.	.	3	.	0.93
<i>Mugil curema</i>	970	8	.	1	5	2	.	.	.	.	.	0.82
<i>Strongylura notata</i>	70	1	.	.	.	1	.	.	.	.	.	1.43
Totals (all taxa)	20,443	29	2	5	7	12	.	.	.	3	.	0.14

* P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D=dead. Bold species are Selected Taxa.

Species Profiles

Introduction

An important use of Fisheries-Independent Monitoring (FIM) program data is to track relative abundance of fish stocks and provide information for use in species management plans, including information on the abundance of juvenile fish. Juvenile indices of abundance (IOAs) measure the relative abundance of newly-recruiting or young-of-the-year (YOY) fish and may be used to describe recruitment processes and forecast population trends. When combined with data on adult fish, a comprehensive picture of the relative condition of a fish population can be constructed. This section provides profiles of species that are routinely collected in FIM program sampling and are of recreational or commercial importance in Florida (i.e., red drum, spotted seatrout, sheepshead, striped mullet, pinfish, common snook, and blue crabs).

Similar analyses were used to develop recruitment indices for each species examined. Data from stratified-random sampling (SRS) were used to create IOAs for YOY target species. Study areas included in the analyses were selected based upon adequate sample sizes of the target species or years of available data, and separate IOAs were calculated for each study area. The specific time periods and sizes of specimens included in the analyses varied among species based upon their individual patterns of recruitment and growth. Length-frequency histograms were examined to determine the time period and size at which the target species fully recruited to the sampling gears. In general, only months of peak abundance were included in the analyses. Larger sizes of fish were typically omitted from the YOY analyses because they were considered to be sub-adult or adult. Such fish were analyzed separately from YOY's for select species.

The YOY IOAs represented annual recruitment and were computed using an Analysis of Covariance (ANCOVA) (Sokal and Rohlf 1981; Hilborn and Walters 1992) to reduce spatial and temporal variability between sets. Location, time, and environmental variables were treated as either classification variables (zone, year, month, gear, deployment technique, sediment type, and presence / absence of bottom vegetation) or covariates (water temperature, salinity, and depth) in the ANCOVA analyses. The GLM

procedure (SAS Institute Inc. 1989) was used to complete all ANCOVA analyses. In order to normalize the data, water temperature, salinity, depth, and number of animals per haul were natural log transformed [$\ln(X+1)$] prior to analysis. With the exception of year, all variables that were not significant ($P>0.05$) were dropped and the analysis was repeated. With the ANCOVA analyses, least squares adjusted means and standard errors were calculated for each year.

Relative abundance was calculated as the median annual number of fish per haul. Median values were determined from the least-squares adjusted means by multiplying the standard error by a random normal deviate ($\mu=0$, $\sigma=1$) and adding it to the least-squares mean. These data were then back-transformed (e^x-1). The process was repeated 500 times for each year to create a sampling distribution of back-transformed means. Summary statistics (10, 25, 75, and 90 percentiles) were then calculated (Sokal and Rohlf 1981).

References

Hilborn, R. and C.J. Walters. 1992. Quantitative fisheries stock assessment: choice dynamics and uncertainty. Routledge, Chapman and Hall, Inc. New York.

SAS Institute, Inc. 1989. SAS/STAT guide for personal computers, version 6, fourth edition. SAS Institute Inc., Cary, North Carolina.

Sokal, R.R. and F.J. Rohlf. 1981. Biometry. Freeman, New York.

Intentionally Left Blank

Red Drum, *Sciaenops ocellatus*

The red drum, *Sciaenops ocellatus*, is an estuarine-dependent species inhabiting coastal waters from Massachusetts to northern Mexico (Yokel 1966; Reagan 1985). This species supports important recreational fisheries throughout the U.S. south Atlantic and Gulf of Mexico coasts. In Florida, dramatic stock reductions in the mid 1980s resulted in a 1986 moratorium on commercial and recreational red drum fisheries. In 1989, the fishery was reopened with strict size and bag limits, as well as a no-sale provision that effectively eliminated the commercial red drum fishery in Florida. Since that time, red drum stocks have shown signs of recovery, and in 1994 abundances were equal to or slightly greater than those observed in the early to mid 1980s (Muller and Murphy 1994). Although fishing mortality estimates have steadily increased since the early 1990s, the most recent model predictions for age-specific indices of red drum (Murphy 2005) indicated that populations in Florida could likely achieve the Commission's management target for red drum of at least a 30% escapement rate through age 4.

In Florida, adult red drum spawn from mid-August through late November (Yokel 1966). Spawning occurs primarily near bay mouths or inlets and over nearshore continental shelf waters (Mercer 1984; Murphy and Taylor 1990), and in some locations inside estuaries (Murphy and Taylor 1990; Johnson and Funicelli 1991). In Florida estuaries, recruitment of juveniles begins in September and continues through February, with peaks occurring in October and November (Reagan 1985; Peters and McMichael 1987; Daniel 1988). Data collected by the Fisheries-Independent Monitoring (FIM) program indicated that settlement of juvenile red drum < 33 mm standard length (SL) typically occurred in the middle or upper reaches of estuaries away from ocean inlets or passes, and was strongly influenced by the availability of low to moderate salinity habitats (FDEP-FMRI 1996). On both coasts, large juvenile red drum enter the fishery at approximately 15 – 18 months of age, and are fully recruited at the beginning of their third year (age-2) (FWC-FMRI 2004). The legal slot limit (457-686 mm total length [TL]) includes primarily age-1 and age-2 fish. Red drum greater than 700 mm SL are uncommon in the FIM program samples from west Florida estuaries, but are

occasionally collected on the east coast in the northern Indian River Lagoon (FWC-FMRI 2004).

In an effort to monitor year-class strength and to improve the ability to predict future adult red drum abundances, the FIM program developed relative abundance indices of juvenile red drum recruitment for selected Florida estuaries. Abundance data for juvenile red drum ≤ 40 mm SL that were collected in stratified-random 21.3-m seine samples were examined to assess recruitment into six Florida estuaries: (in order of inception) Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, Cedar Key, Apalachicola Bay, and northeast Florida. Juvenile red drum recruited to habitats sampled with our 21.3-m seines primarily from September – December, although the onset of recruitment was delayed until October in some bays (Tampa Bay and Apalachicola), and recruitment extended into January (Charlotte Harbor and Cedar Key) or February (northern Indian River Lagoon) in some years. Therefore, these bay-specific months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Indices of abundance (IOAs) for juvenile red drum were not calculated for the southern Indian River Lagoon where 21.3-m seines were not included as a sampling gear. The FIM program also monitors the abundance of large juvenile and subadult red drum within these same Florida estuarine systems (including the southern Indian River Lagoon). Data from stratified-random 183-m haul seines were used to develop IOAs for fish that fall within the legal 18-27 inch total length slot limit for the fishery (457-686 mm TL; 374-565 mm SL from Murphy and Taylor 1990). These IOAs were derived by including all legal size red drum collected between January and December from 1996 – 2007.

On Florida's southwest coast, trends in the relative abundances of juvenile red drum were very similar between Tampa Bay and Charlotte Harbor (Figure SP07-01). Between 1989 and 2007, relative abundance estimates generally exhibited only small fluctuations, although there were pronounced increases in both of these systems in 1995 and 2002. These peaks were followed by a relatively large decline in 1996 and a steady but gradual decline from 2002 through 2007. The fact that similar patterns have been observed over the past 19 years in these disjunct estuarine systems suggests that red drum recruitment along this section of Florida's Gulf of Mexico coast may be

influenced by factors which operate over regional scales. Estimates of relative abundance for legal-size fish in Tampa Bay and Charlotte Harbor also followed similar patterns to each other, with each system exhibiting increased abundances in 1998, 2003, and 2005.

On Florida's northwest coast, the relative abundance of juvenile red drum in Apalachicola Bay peaked in 2002, but otherwise varied little between 1999-2007 (Figure SP07-01). In Cedar Key, juvenile abundances fluctuated at relatively low levels through 2002 after a decline from the observed peak in 1997. Abundances increased in 2003 and have remained relatively stable through 2007. The abundances of legal-size red drum in Apalachicola Bay have remained relatively consistent since 1998, with a temporary increase during 2003. The abundances of legal-size red drum in Cedar Key were relatively high from 1998 – 2001, but have since fluctuated at lower levels through 2007.

On the east coast, relative abundance estimates for juvenile red drum in northeast Florida estuaries (lower St. Johns, lower Nassau, and lower St. Marys rivers) declined from 2003 to 2005, but returned to previously observed levels through 2007. The relative abundances of legal-size red drum increased in 2004 but returned to their previous levels through 2007 (Figure SP07-01).

In the northern Indian River Lagoon (IRL) on Florida's east coast, estimates for juvenile red drum abundance remained relatively stable between 1990-1997 (Figure SP07-01). In 1998, the sampling area was expanded to include some of the more productive juvenile red drum nursery habitats located in the vicinity of the St. Sebastian River. Since that time, estimates of recruitment for juvenile red drum increased steadily through 2003, followed by a very strong year class in 2004. Relative abundances have since returned to pre-2004 levels and remained there through 2007. Estimates of abundance for legal-size red drum in the northern IRL have fluctuated without trend since 1997. A sharp increase in abundance was observed in 2000 followed by a periods of general decline through 2004 and slight increases in 2005 and 2006. In 2007, abundances increased sharply to the highest levels observed thus far. In the southern IRL, legal-size red drum abundances exhibited cyclic peaks that occurred at three-year

intervals (1997, 2000, and 2003). However, since 1997, there has been a slow overall trend towards decline of legal-size red drum in this portion of the IRL.

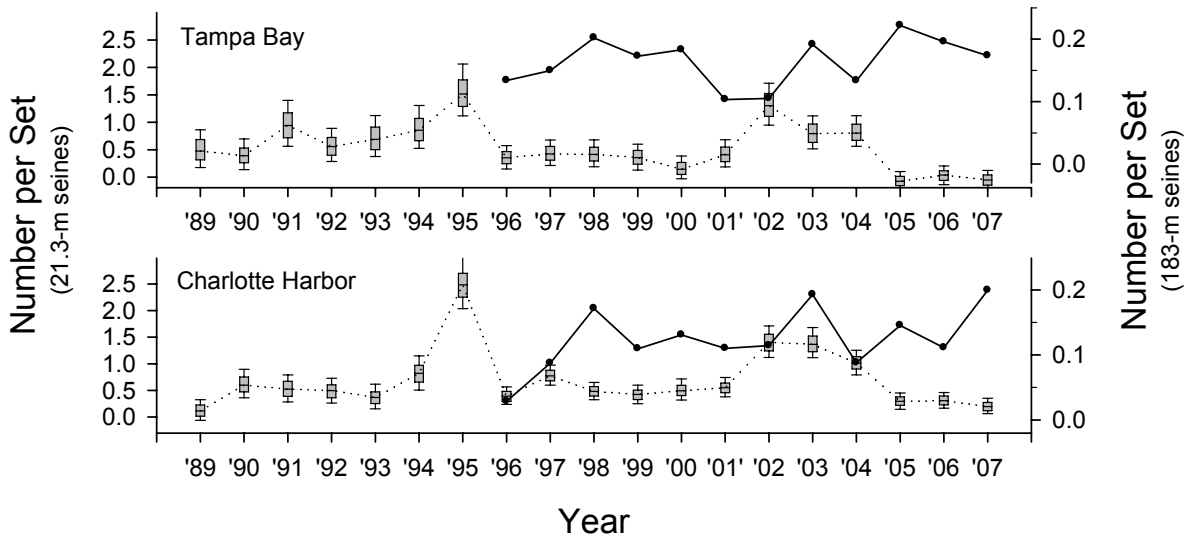
There is not a clear relationship between the relative abundances of juvenile red drum and future abundances of legal-size red drum. Correlation tests were used to compare juvenile abundances through 2005 with legal-size red drum abundances observed during the following year. These tests were not statistically significant for any of the estuarine systems sampled (Spearman rank correlation, $\alpha = 0.05$). This may be partially due to the presence of multiple age-classes (age-1 and age-2) within the legal slot limit. However, in some instances, large increases in juvenile abundances were followed by peaks in legal-size fish during the following year (e.g., Tampa Bay and Charlotte Harbor, 2002; Apalachicola, 2002; Cedar Key, 1997). Similarly, the sharp increase in legal-size red drum in the northern IRL in 2007 may reflect increases in age-2 fish resulting from a very strong 2004 year-class. Also, declines in juvenile abundance were followed by declines in the legal-size fish for some years in Charlotte Harbor (1998) and Apalachicola Bay (2003). While a strict relationship was not consistent or apparent in all bay systems, these data do suggest there is potential with more refined analyses to answer questions about future year class strength of legal-sized fish based upon the relative abundances of juvenile red drum.

References

- Daniel, L. B. 1988. Aspects of the biology of juvenile red drum, *Sciaenops ocellatus*, and spotted seatrout, *Cynoscion nebulosus* (Pisces: Sciaenidae) in South Carolina. M.S. Thesis, College of Charleston. 58 p.
- FDEP-FMRI. 1996. Fisheries-Independent Monitoring Program 1996 annual data summary report. Florida Marine Research Institute. St. Petersburg, Florida.
- FWC-FMRI. 2004. Fisheries-Independent Monitoring Program 2003 annual data summary report. Florida Marine Research Institute. St. Petersburg, Florida. IHR 2004-003.
- FWC-FWRI. 2006. Fisheries-Independent Monitoring Program 2005 annual data summary report. Fish and Wildlife Research Institute. St. Petersburg, Florida. IHR 2006-010.
- Johnson, D. R. and N. A. Funicelli. 1991. Spawning of red drum in Mosquito Lagoon, east-central Florida. *Estuaries* 14:74-79.
- Mercer, L. P. 1984. A biological and fisheries profile of red drum, *Sciaenops ocellatus*. Spec. Sci. Rep. 41, NC Dept. Nat. Resour. Community Dev. Div. Mar. Fish., Raleigh, 89 p.
- Muller, R. and M. D. Murphy. 1994. Stock assessment of red drum, *Sciaenops ocellatus*, in Florida. Florida Marine Research Institute Report to Florida Marine Fisheries Commission. 28 p.
- Murphy, M. D. 2005. A stock assessment of red drum, *Sciaenops ocellatus*, in Florida: status of the stocks through 2003. Florida Marine Research Institute Report to Florida Marine Fisheries Commission. 35 pages.

- Murphy, M. D. and R. G. Taylor. 1990. Reproduction, growth, and mortality of red drum, *Sciaenops ocellatus*, in Florida. Fishery Bulletin, United States. 88:531-542.
- Peters, K. M. and R. H. McMichael. 1987. Early life history of the red drum, *Sciaenops ocellatus* (Pisces: Sciaenidae), in Tampa Bay, Florida. Estuaries 10:92-107.
- Reagan, R. E. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico). Red drum. FWS/OBS Biol. Rep. 82(11.36 TR EL-82-4):1-16.
- Yokel, B. J. 1966. A contribution to the biology and distribution of red drum, *Sciaenops ocellata*. Master's Thesis. University of Miami, Miami, FL. 160 p.

A) Southwest Coast (Gulf of Mexico)



B) Northwest Coast (Gulf of Mexico)

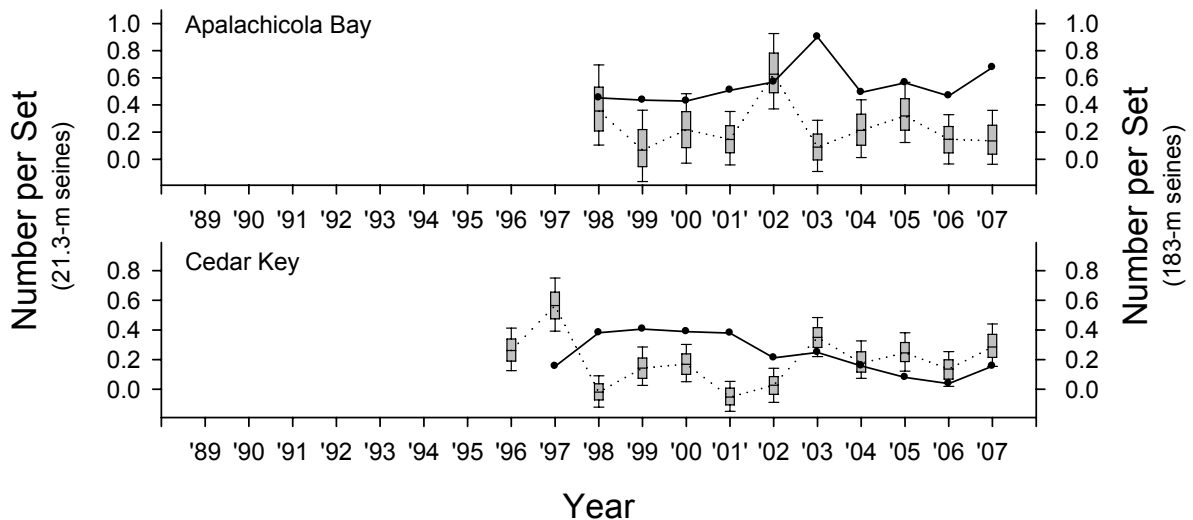


Figure SP07-01. Relative abundance of juvenile red drum (≤ 40 mm SL) collected in 21.3-m seines between 1989 and 2007 (dotted line) and of legal-size red drum (374-565 mm SL) collected in 183-m haul seines between 1997 and 2007 (solid line) during stratified-random sampling from six Florida estuarine systems located on Florida's (A) Southwest Coast, (B) Northwest Coast, and (C) East Coast. Box Plots represent the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line within each box indicates the median estimate. Note different scales in some cases for estimates from 21.3-m and 183-m seines.

C) East Coast (Atlantic Ocean)

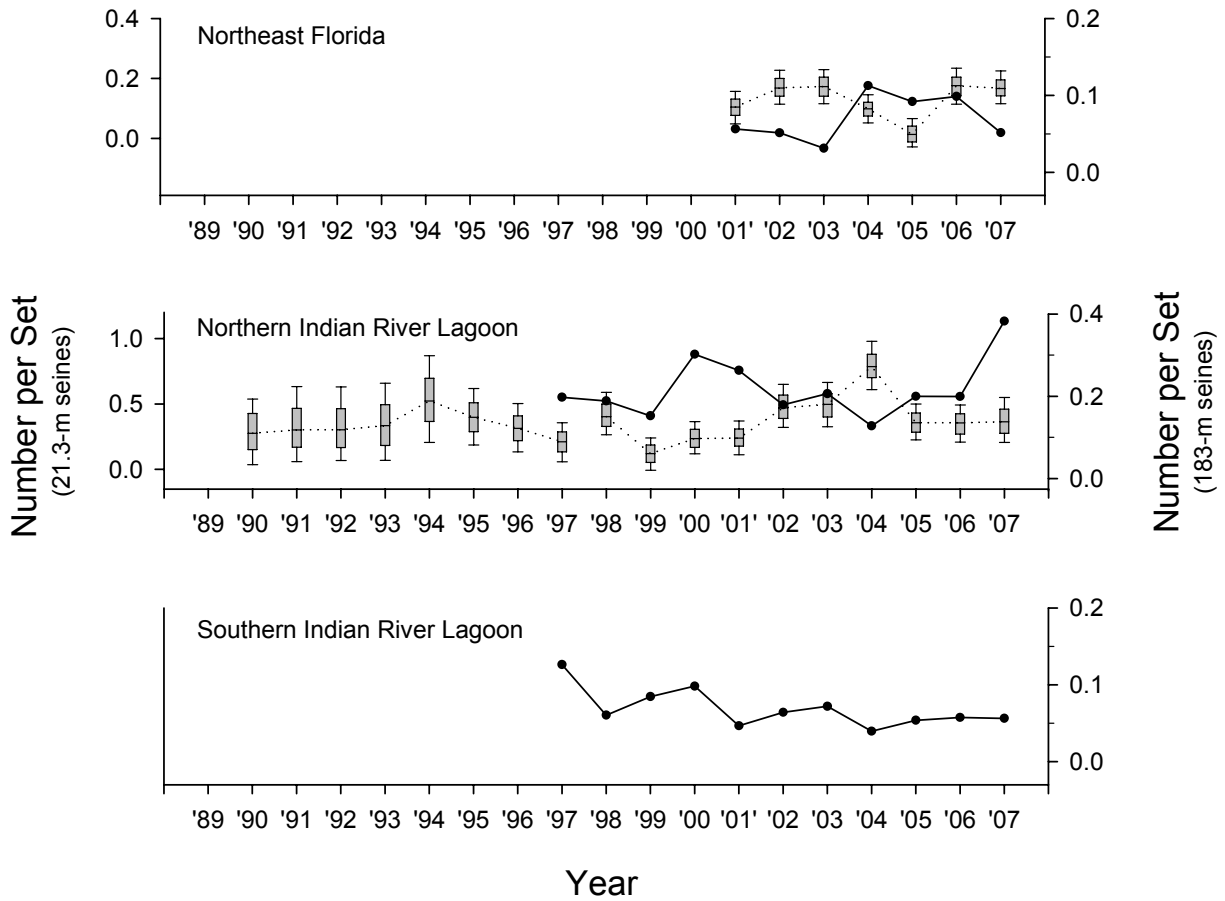


Figure SP07-01. (continued) Relative abundance of juvenile red drum (≤ 40 mm SL) collected in 21.3-m seines between 1989 and 2007 (dotted line) and of legal-size red drum (374-565 mm SL) collected in 183-m haul seines between 1997 and 2007 (solid line) during stratified-random sampling from six Florida estuarine systems located on Florida's **(A)** Southwest Coast, **(B)** Northwest Coast, and **(C)** East Coast. Box Plots represent the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line within each box indicates the median estimate. The broken line between 1997 and 1998 for Indian River Lagoon represents a change in the 21.3-m seine sampling universe in this estuary. Note different scales in some cases for estimates from 21.3-m and 183-m seines. (The 21.3-m seine was not utilized in the southern Indian River Lagoon).

Spotted Seatrout, *Cynoscion nebulosus*

Spotted seatrout, *Cynoscion nebulosus*, occur in temperate to tropical estuarine and coastal waters on the Atlantic and Gulf of Mexico (Gulf) coasts of the United States (Bortone 2002). In Florida, spotted seatrout have historically supported economically-important recreational and commercial fisheries. Since the mid-1990's various commercial and recreational fishing regulations have been adopted to support the rebuilding of spotted seatrout stocks (Murphy et al. 1999). With these regulatory changes, the spotted seatrout fishery has moved from a mixed-sector fishery, with about 20% of the landings made by commercial fishers, to an almost exclusive (99% by weight) recreational fishery (Chagaris et al. 2008). Average commercial landings from 1996 – 2002 were only 7.5% of those from 1990 – 1994, and only 4.5% of those from 1986 – 1989. In 2002, only 266 commercial fishers reported landings of *C. nebulosus*, compared to 2,151 in 1994 (Murphy 2003), and commercial effort levels continue to be significantly less than the recreational sector (Murphy et al., 2006). Total landings for this species in Florida during 2006 were 2,963,147 pounds, with 99% of this total from the recreational fishery (FWC-FWRI fisheries landings data 2007).

Adult spotted seatrout begin to spawn in March or April in southwest and west-central Florida estuaries (i.e., Tampa Bay and Charlotte Harbor; McMichael and Peters 1989) and in April or May in the more northerly Florida estuaries (i.e., northern Indian River Lagoon: Tabb 1961, Crabtree and Adams 1998; Cedar Key: Moody 1950; and Apalachicola Bay: Devries et al. 2002). Protracted spawning of spotted seatrout continues throughout the summer and into late September or October, depending upon location (Murphy et al. 1999). Spawning generally occurs during the evening hours in deep channels and depressions near grass flats in estuarine areas with water temperature $>21^{\circ}\text{C}$ (Tabb 1966; Helser et al. 1993). Estuarine water temperatures below 20°C may reduce hatching success for spotted seatrout (Gray et al. 1991). Recruitment of juveniles in estuarine areas is evident from April – October in Tampa Bay and Charlotte Harbor, and from May – November in the northern Indian River Lagoon, northeast Florida, and Cedar Key. In Apalachicola Bay, young-of-the-year (YOY) spotted seatrout recruitment is evident from June – October. These recruitment

periods coincided with published recruitment and spawning periods of spotted seatrout throughout Florida (Moody 1950; Nelson and Leffler 2001; Devries et al. 2002; Walters et al., 2007).

The Fish and Wildlife Research Institute's Fisheries-Independent Monitoring (FIM) program's data were used to generate indices of relative abundance (IOAs) for YOY and adult spotted seatrout in selected Florida estuaries. These data allow monitoring of relative year-class strength, correlation of juvenile abundances with subsequent abundance of adult spotted seatrout, and better ability to predict future adult spotted seatrout abundances. Data from stratified-random 21.3-m seine sampling were used to assess the recruitment of juvenile spotted seatrout (≤ 100 mm SL) from Apalachicola Bay, Cedar Key, Tampa Bay, Charlotte Harbor, northern Indian River Lagoon and northeast Florida.

Overall, annual YOY relative abundance estimates of spotted seatrout from most estuarine systems have been stable over the past five years (Figure SP07-02). In Apalachicola Bay and Cedar Key, highest YOY relative abundance occurred in 1998, with lower median levels in all subsequent years. There was a minor increase in abundance in Tampa Bay from 2002 – 2004, followed by lower levels from 2005 – 2007. Minor decreases in YOY relative abundance were observed in all Florida estuarine systems from 2006 – 2007. Inter-annual fluctuations of YOY relative abundance in all monitored Florida estuaries have been unpredictable since monitoring began in each of these areas.

Monthly stratified-random sampling (SRS) with 183-m haul seines (≤ 2.5 -m water depths) was established in estuarine sampling areas by the FIM program beginning in 1996 and 1997. The haul seine was deployed along shallow-water shoreline areas within a wide variety of habitat types. Data collected from 183-m haul seines (January – December) were used to assess the relative abundance of the larger spotted seatrout (>100 mm SL) from Apalachicola Bay, Cedar Key, Tampa Bay, Charlotte Harbor, northern Indian River Lagoon and northeast Florida (Figure SP07-02). Collections from the southern Indian River Lagoon were not analyzed due to very low numbers of spotted seatrout collected.

Overall patterns of annual relative abundance estimates of adult spotted seatrout were estuary specific (Figure SP07-02). The relative abundance of adult spotted seatrout in Apalachicola increased from 2003 – 2007. In Charlotte Harbor, highest relative abundance levels occurred from 2002 – 2004. Adult spotted seatrout in Cedar Key followed a pattern similar to YOY abundance in this system with a relatively strong peak in 1998 followed by comparatively lower levels in all subsequent years. Relative abundance of adult spotted seatrout in Tampa Bay displayed an increasing trend from 2000 – 2004, with a return to lower levels after 2004. The increasing trend in adult abundance observed in the northern Indian River Lagoon increased to a peak from 2001 – 2004 and returned to lower levels in the years that followed (Figure SP07-02). In northeast Florida, a decline in relative abundance was noted in 2004, with higher levels in all other years.

Length-frequency data collected with 183-m haul seines suggest that this gear provides valuable information on adult and larger sub-adult spotted seatrout (Figure SP07-03). Two cohorts were collected by 183-m haul seines in the Gulf coast estuaries. The younger cohort primarily consisted of fish < 200 mm SL, while the older cohort consisted of adults > 250 mm SL. The size distributions of spotted seatrout collected by 183-m haul seines in the Atlantic coast were more unimodal. The majority of fish collected in these Atlantic coast estuarine systems ranged from approximately 100 – 400 mm SL.

References

- Bortone, S.A. 2002. Introduction. In: Biology of the Spotted Seatrout (Bortone, S.A., ed.) CRC Press, Boca Raton, pp 1-3.
- Chagaris, D., B. Mahmoudi, R.G. Muller, J. Munyandorero, Murphy, M.D., J. O'Hop, M.F.D. Greenwood and T.S. Switzer. 2008. Florida's inshore and nearshore species: 2007 Status and Trends Report. Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute.
- Crabtree, R.E. and D.H. Adams. 1998. Spawning and fecundity of spotted seatrout, *Cynoscion nebulosus*, in the Indian River Lagoon, Florida. in Investigations into nearshore and estuarine gamefish abundance, ecology, and life history in Florida (Project F-59). FWC-FMRI technical report to U.S. Fish and Wildlife Service, pp. 526-566.
- Devries, D.A., C.D. Bedee, C.L. Palmer, and S.A. Bortone. 2002. The demographics and reproductive biology of spotted seatrout, *Cynoscion nebulosus*, in six northwest Florida estuaries. In: Biology of the Spotted Seatrout (Bortone, S.A., ed.). CRC Press, Boca Raton, pp 79-98.
- Gray, J.D., T.L. King and R.L. Colura. 1991. Effects of temperature and hypersalinity on hatching success of spotted seatrout eggs. Progressive Fish Culturist 53:81-84.
- Helser, T.E., R.E. Condrey, and J.P. Geaghan. 1993. Spotted seatrout distribution in four coastal Louisiana estuaries. Transactions of the American Fisheries Society 122:99-111.
- McMichael, R.H. Jr., and K.M. Peters. 1989. Early life history of the spotted seatrout, *Cynoscion nebulosus*, Pisces: Sciaenidae, in Tampa Bay, Florida. Estuaries 12:98-110.

- Moody, W.D. 1950. A study of the natural history of the spotted trout, *Cynoscion nebulosus*, in the Cedar Key, Florida, area. Quarterly Journal of the Florida Academy of Sciences 12, 147 – 172.
- Murphy, M.D. 2003. A stock assessment of spotted seatrout *Cynoscion nebulosus* in Florida: status of stocks through 2001. FWC-FWRI Report.
- Murphy, M.D., G.A. Nelson, and R.G. Muller. 1999. An update of the stock assessment of the spotted seatrout, *Cynoscion nebulosus*. Florida Marine Research Institute Report to the Florida Fish and Wildlife Conservation Commission. 122 pp.
- Murphy, M.D., C.B. Guenther, and B. Mahmoudi. 2006. An assessment of the status of spotted seatrout in Florida waters through 2005. Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute In-House Report IHR2006-017.
- Nelson, G.A. and D.L. Leffler. 2001. Abundance, spatial distribution, and mortality of young-of-the-year spotted seatrout (*Cynoscion nebulosus*) along the Gulf Coast of Florida. Gulf of Mexico Science 19:30-42.
- Tabb, D.C. 1961. A contribution to the biology of the spotted seatrout, *Cynoscion nebulosus* (Cuvier), of east-central Florida. Florida Board of Conservation Technical Series 35.
- Tabb, D.C. 1966. The estuary as a habitat for spotted seatrout, *Cynoscion nebulosus*. American Fisheries Society Special Publication 3:58-67.
- Walters, S., S. Lowerre-Barbieri, J. Bickford, L. Crabtree, and D. Mann. 2007. Preliminary results on seasonal and diel periodicities of a resident *Cynoscion nebulosus* spawning aggregation in Tampa Bay, Florida. Proceedings of the Gulf and Caribbean Fisheries Institute, v.58, p. 295-296.

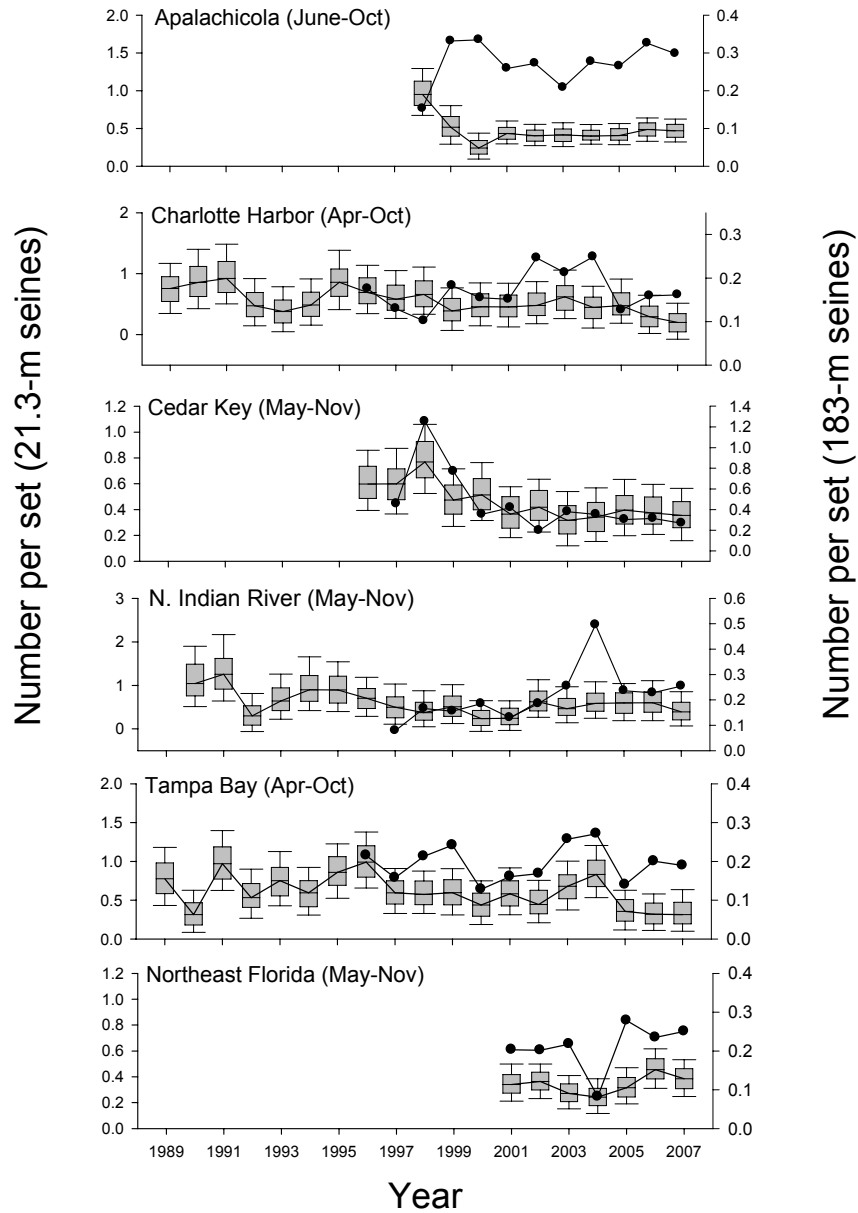


Figure SP07-02.

Relative abundance of juvenile spotted seatrout (≤ 100 mm SL) collected during 1989 – 2007 using 21.3-m seines. The box represents the 25th and 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line indicates the median estimate. The dark line with filled circles (●) represents median relative abundance of adult spotted seatrout (>100 mm SL) collected using 183-m haul seines. Note different scales.

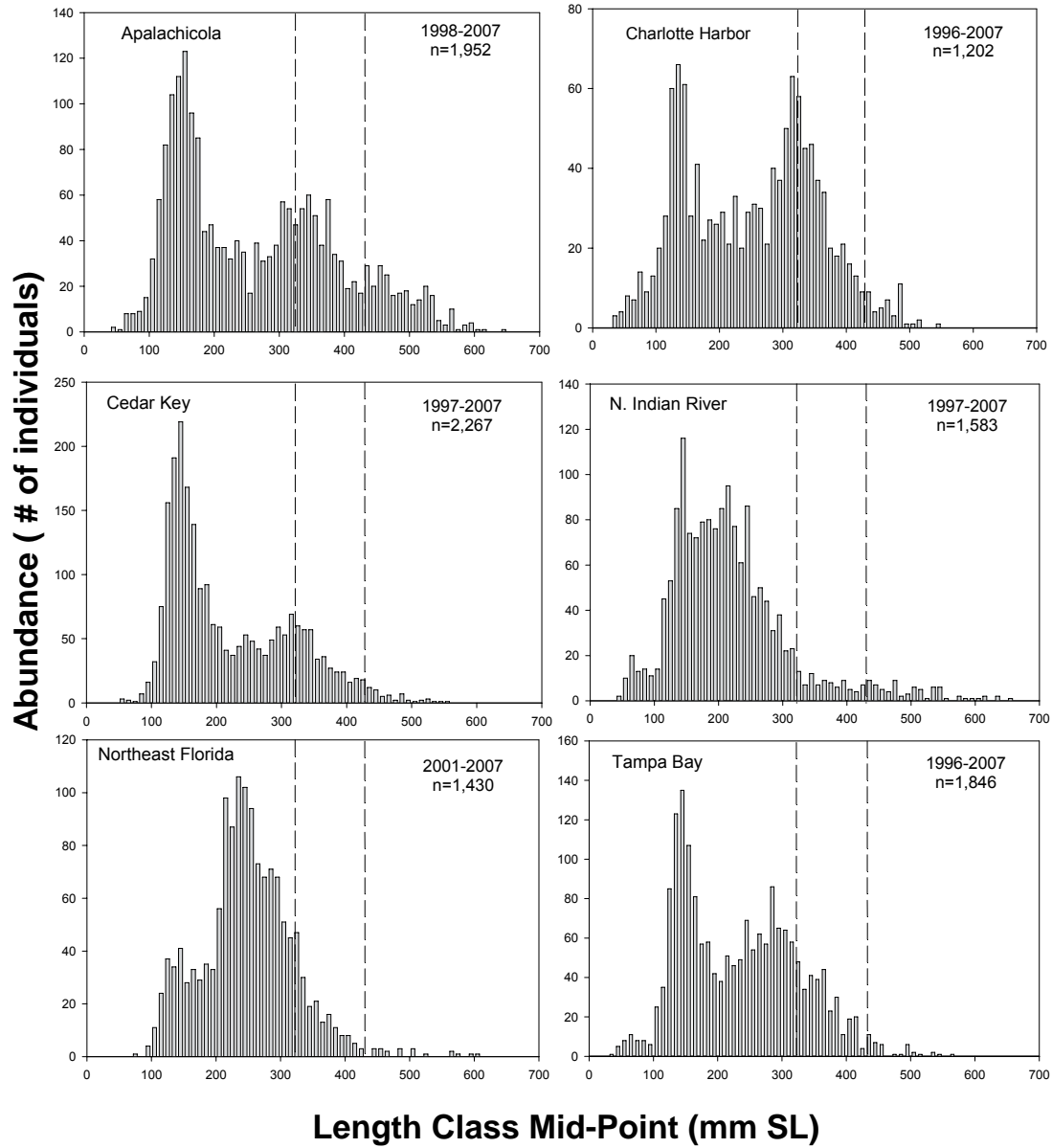


Figure SP07-03. Length frequency diagrams of spotted seatrout collected using 183-m haul seines. Area between dashed lines (- - -) indicates permitted recreational harvest size range. All lengths are standard length (SL). Note different scales and years of collection.

Intentionally Left Blank

Sheepshead, *Archosargus probatocephalus*

The sheepshead, *Archosargus probatocephalus*, is common in coastal estuarine and inner- to mid-shelf waters from Cape Cod to Brazil (Jennings 1985). Recreational and commercial fishermen commonly harvest sheepshead, with the recreational fishery accounting for almost 90% of the total pounds landed in recent years (Munyandorero et al. 2006). Sheepshead in Florida waters are currently regulated by size (305-mm fork length, 268-mm standard length) and bag limits (15 fish/day). The most recent stock assessment for sheepshead used Fisheries-Independent Monitoring (FIM) program data to derive annual indices of abundance (IOAs) during different life history stages to constrain coast-specific catch-at-age models (Munyandorero et al. 2006). This stock assessment determined that sheepshead stocks on the Gulf and Atlantic coasts appeared abundant enough to supply adequate numbers of new recruits while maintaining current harvest rates.

Adult sheepshead reproduce between February and April in Florida waters and the newly recruited young-of-the-year (YOY) are most abundant in shallow estuarine areas between April and June. Young-of-the-year sheepshead grow at approximately 0.32 mm per day (FWC- FMRI 2001) and typically reach 40 mm standard length (SL) by June and 130 mm SL by April of the following year (age 1). Sheepshead in Florida waters enter the fishery at 268 mm SL, which corresponds to an age of 3 - 6 years (Dutka-Gianelli and Murie 2001).

Catch data from the FIM program's stratified-random sampling (SRS) surveys were examined to assess sheepshead relative abundances during four life history stages: early YOY, late YOY, pre-fishery, and fully recruited. Gear types and months for examination varied for each life history stage (Table SP07-01). Sheepshead \leq 40-mm SL represented early YOY (Figure SP07-04) in each estuary, while sheepshead between 50 and 95 mm SL represented late YOY (Figure SP07-05). Additionally, abundance analyses were conducted separately for sheepshead that had not yet entered the fishery (131 – 267 mm SL) and for those that were fully recruited to the fishery (\geq 268 mm SL; Figure SP07-05). Annual estimates of relative abundance were not calculated for early or late YOY sheepshead in Apalachicola Bay, Cedar Key, or northeast Florida due to relatively small sample sizes

(Figure SP07-04). Annual IOAs for early YOY sheepshead were not available for the southern Indian River because sampling with 21.3-m seines was not conducted in this area.

Trends in annual abundances of early YOY sheepshead were assessed for Tampa Bay, Charlotte Harbor, and northern Indian River Lagoon (Figure SP07-06). Annual abundance estimates in Tampa Bay and Charlotte Harbor were similar from 1989 – 1996, with peaks during 1991 and 1994. Peaks in abundance in Tampa Bay also occurred during 1997, 2000, and 2004, while a peak occurred in Charlotte Harbor during 2004. In the northern Indian River Lagoon, annual abundance estimates have been variable. Peaks in abundance occurred in the northern IRL during 2000, 2004, and 2007.

Annual abundances of late YOY sheepshead were generally similar to the trends for early YOY sheepshead (Figure SP07-06). Abundances of late YOY sheepshead in Tampa Bay and Charlotte Harbor peaked in 2003 and were lowest in 2001. On the Atlantic coast, abundances in the northern and southern Indian River Lagoons peaked during 2000 and 2007. A third peak was observed in northern Indian River Lagoon during 2004.

Trends in annual abundance estimates of pre-fishery sheepshead were estuarine-specific (Figure SP07-07). Those in Apalachicola Bay and Cedar Key demonstrated relatively stable annual abundance estimates. Pre-fishery sheepshead in Charlotte Harbor exhibited an increasing trend in abundance since 1996. Those in Northeast Florida have demonstrated a decreasing trend in abundance since 2002. Annual abundances of pre-fishery sheepshead in Tampa Bay, northern Indian River Lagoon, and southern Indian River Lagoon have been widely variable.

Annual abundance estimates of fully-recruited sheepshead were also found to be estuarine-specific (Figure SP07-07). An increasing trend was observed in Apalachicola Bay since 1998. Decreasing trends were observed in Cedar Key since 1997 and in Northeast Florida since 2003. Annual abundances of fully-recruited sheepshead in Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, and southern Indian River Lagoon were more variable. Relatively high abundances were observed in all four of these estuaries in 2003 - 2004.

References

- Dutka-Gianelli, J., and D.J. Murie. 2001. Age and growth of the sheepshead, *Archosargus probatocephalus* (Pisces: Sparidae), from the Northwest Coast of Florida. *Bulletin of Marine Science* 68(1):69-83.
- Jennings, C.A. 1985. Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates in the Gulf of Mexico. Sheepshead. U.S. Fish and Wildlife Services Biological Report. 10 pp.
- FWC-FMRI. 2001. Fisheries-Independent Monitoring Program 2000 Annual Data Summary Report. Florida Marine Research Institute. St. Petersburg, Florida.
- Munyandorero, J., M.D. Murphy, and T.C. MacDonald. 2006. An assessment of the status of sheepshead in Florida waters through 2004. Florida Fish and Wildlife Research Institute In-House Report 2006-009, St. Petersburg, Florida. 110 pp.

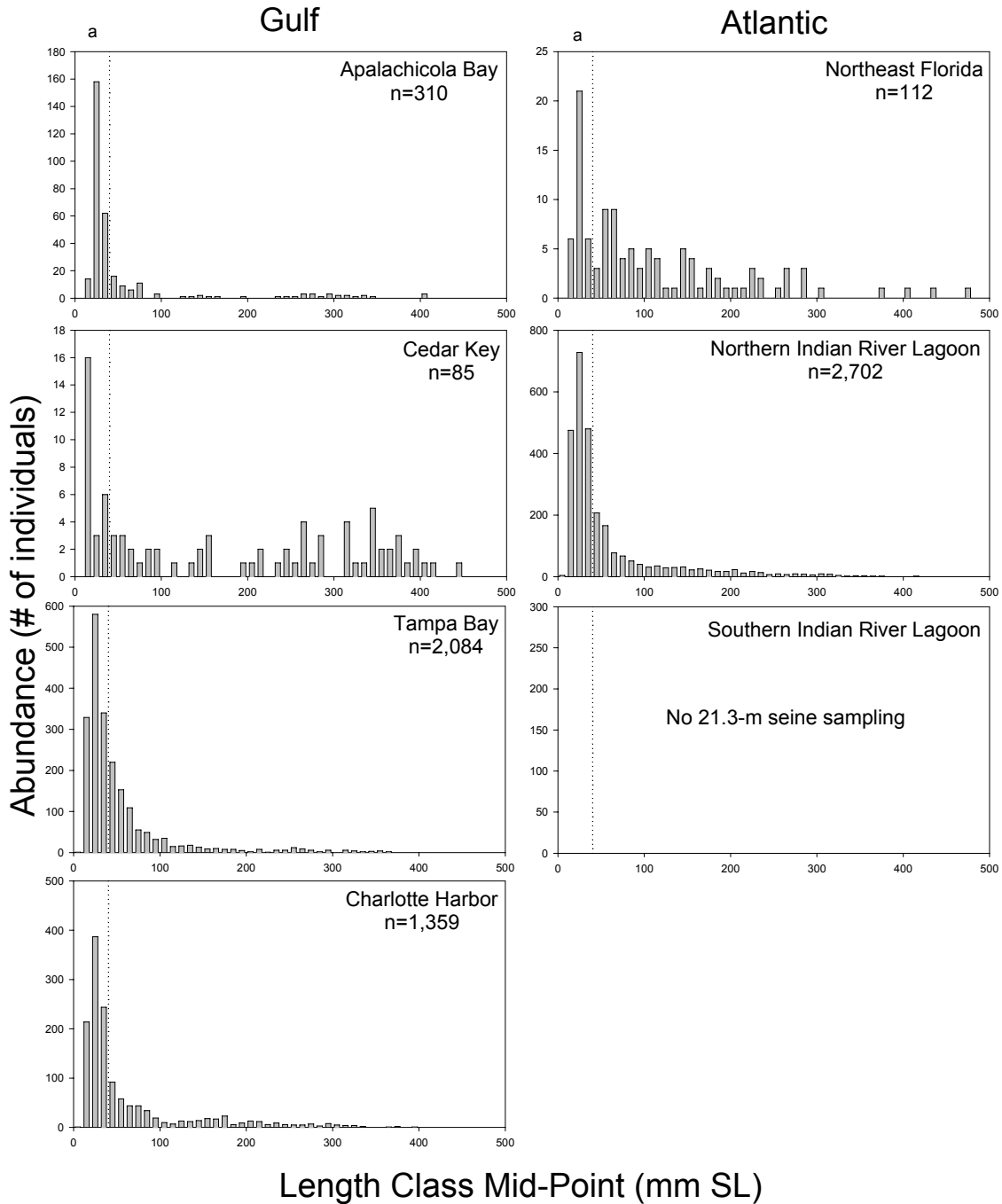


Figure SP07-04.

Length frequency distribution of sheephead collected during 21.3-m seine stratified-random sampling in each of the estuaries surveyed by the Fisheries-Independent Monitoring program. Charlotte Harbor and Tampa Bay were surveyed from 1989 – 2007; the northern Indian River Lagoon was surveyed from 1990 – 2007; Cedar Key was surveyed from 1996 – 2007; Apalachicola Bay was surveyed from 1998 – 2007; and northeast Florida was surveyed from 2001 – 2007. The southern Indian River lagoon was not surveyed with 21.3-m seines. The vertical dotted line and letter (a) denotes the early young-of-year size class. n=number of fish. Note the different scales for each system.

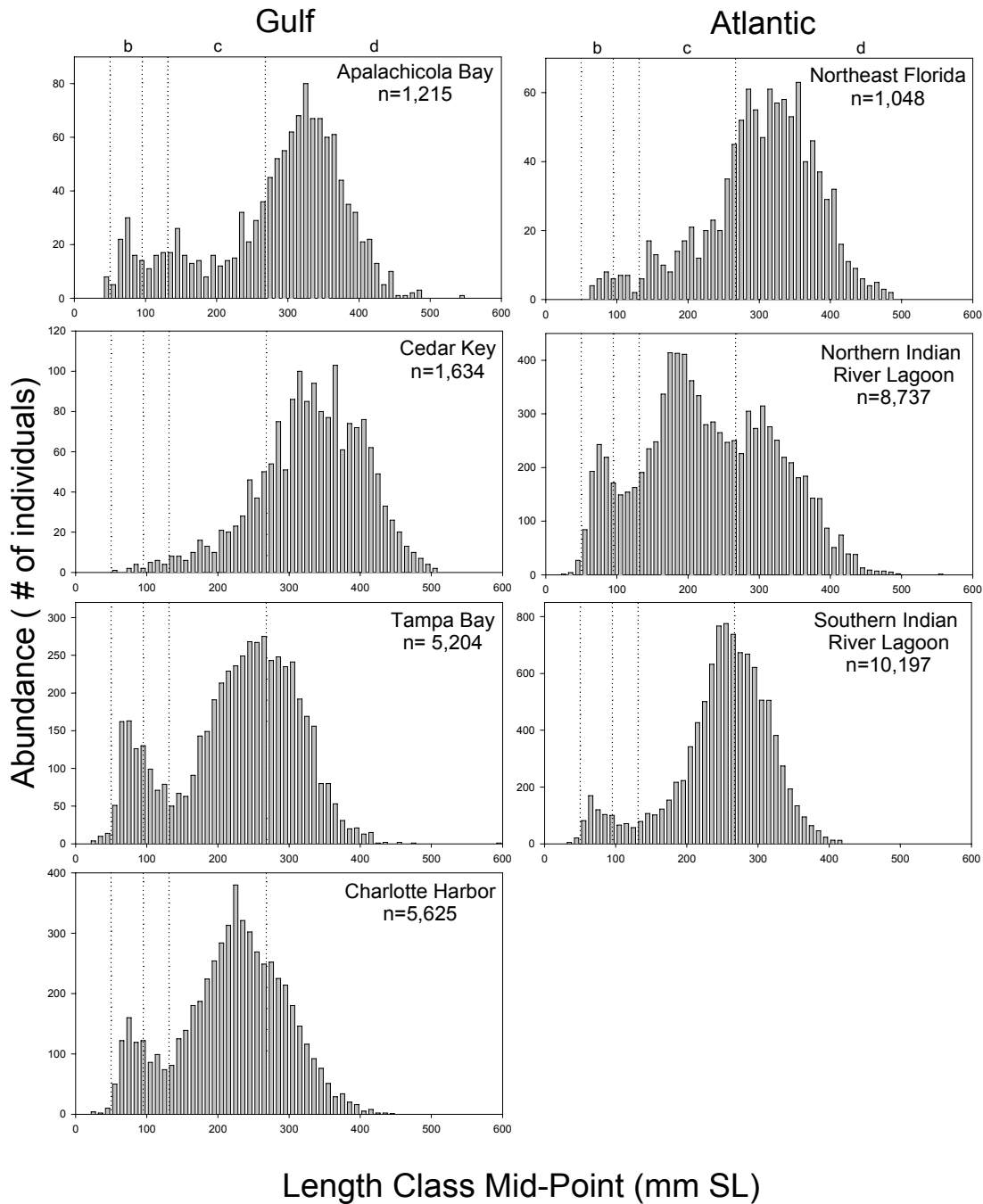


Figure SP07-05.

Length frequency distribution of sheephead collected during 183-m haul seine stratified-random sampling surveys in each of the estuaries surveyed by the Fisheries-Independent Monitoring program. Charlotte Harbor and Tampa Bay were surveyed from 1996 – 2007; southern and northern Indian River Lagoon, and Cedar Key were surveyed from 1997 – 2007; Apalachicola Bay was surveyed from 1998 – 2007; and northeast Florida was surveyed from 2001 – 2007. The dotted vertical lines and letters designate three of the life history stages analyzed: b) late young-of-year, c) pre-fishery, and d) fully recruited. n = number of fish. Note the different scales for each system.

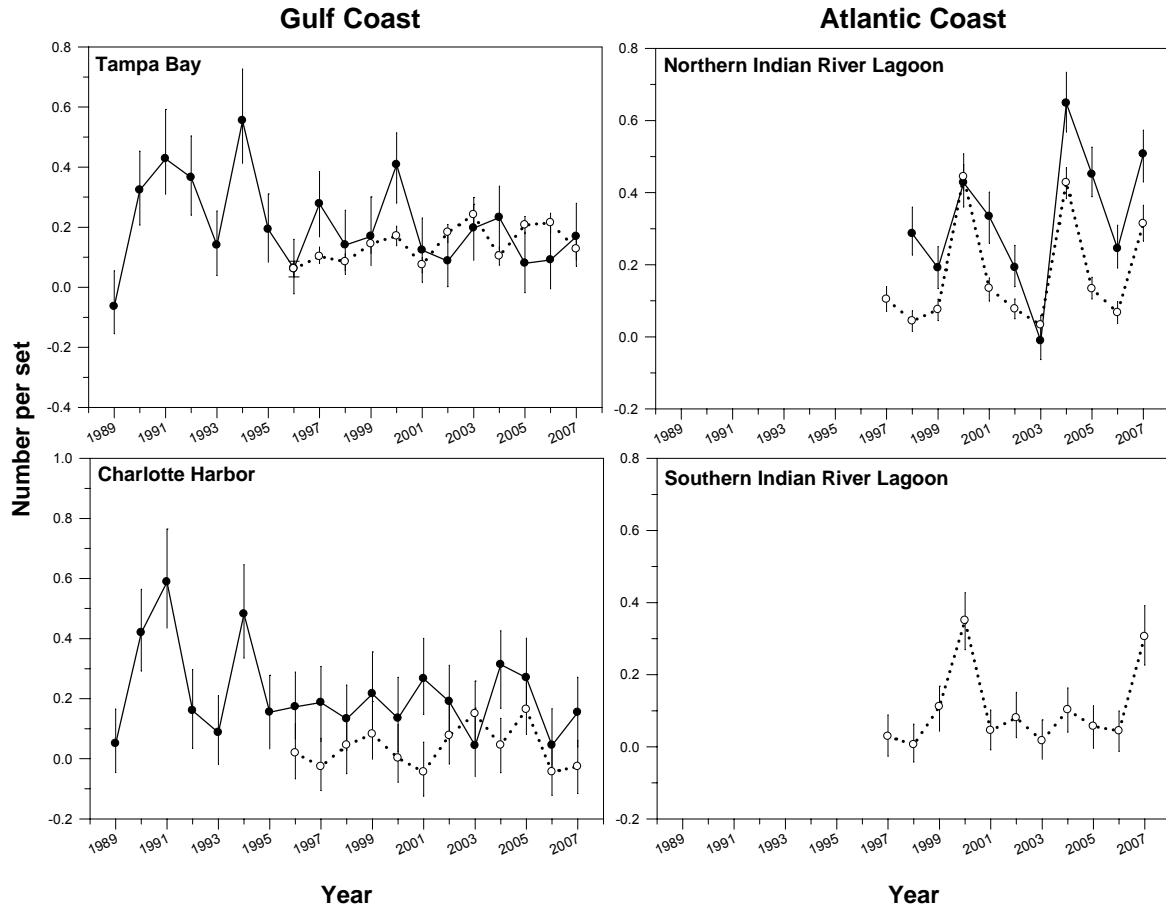


Figure SP07-06.

Annual relative abundance estimates for young-of-the-year sheephead collected during stratified-random sampling surveys in estuaries along the Gulf and Atlantic Coasts of Florida. Early YOY sheephead (≤ 40 mm SL, collected in 21.3-m seines between April and July) are represented by filled circles. Open circles represent late YOY sheephead (50 - 95 mm SL) collected in 183-m haul seines between August and December. Symbols (opened and filled circles) represent median values and vertical lines represent interquartile ranges. Note the different scales for each system.

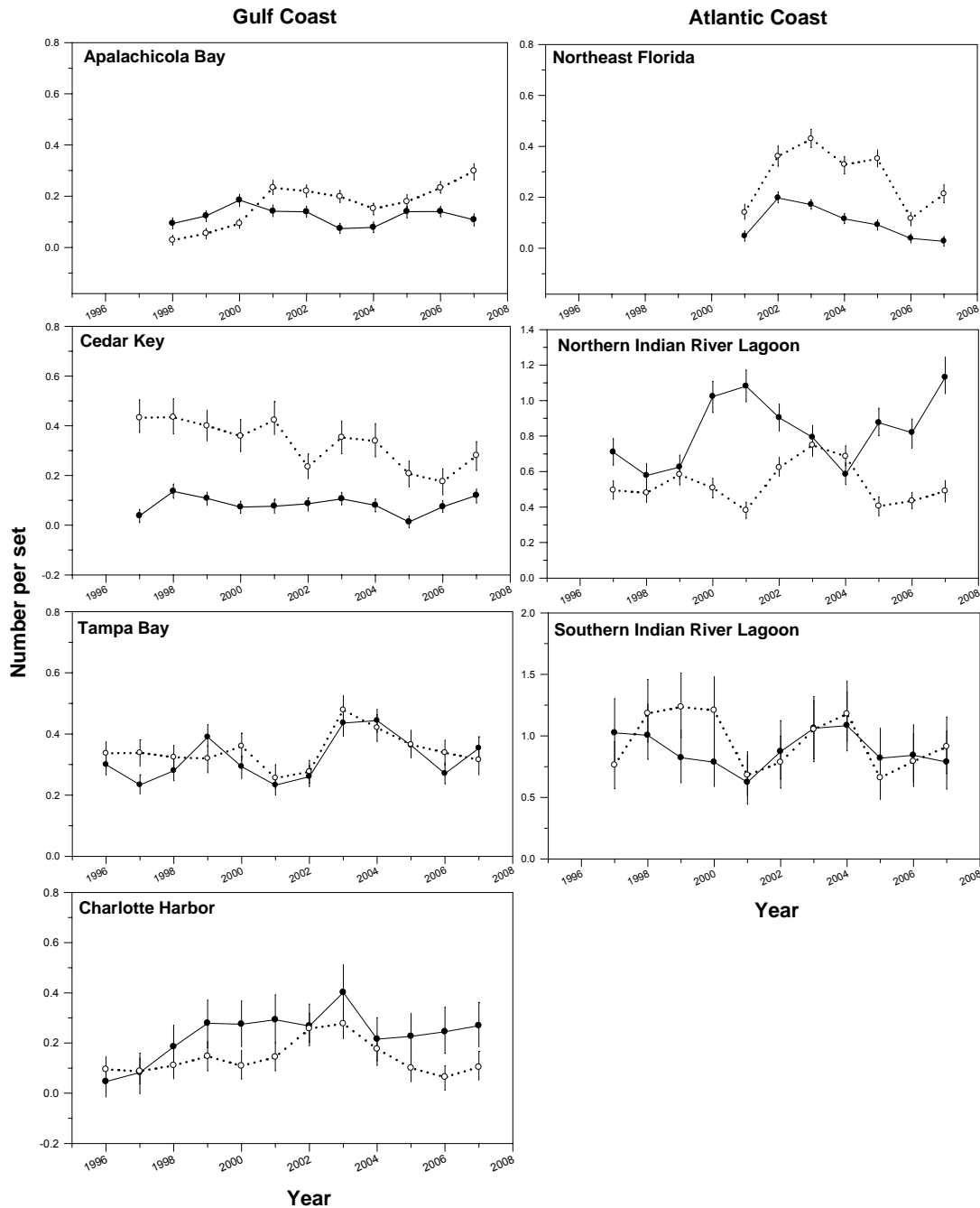


Figure SP07-07. Annual relative abundance estimates for pre-fishery (131 - 267 mm SL; filled circles) and fully-recruited (≥ 268 mm SL; open circles) sheepshead collected during stratified-random sampling surveys in estuaries along the Gulf and Atlantic Coasts of Florida. Year represents a biological year (April – March); abundance estimates for 2007, therefore, are based on a partial year since January – March 2008 data were not available for analysis. Symbols (opened and filled circles) represent median values and vertical lines represent interquartile ranges. Note the different scales for each system.

Table SP07-01. Size ranges, gear types, and months examined when calculating annual indices of abundance for each life history stage of sheepshead. Italicized letter is used to designate life history stages in length-frequency figures.

Life History Stage	Size Range (mm SL)	Gear types	Months	
Early YOY	≤ 40	21.3-m seines (bay and river sets)	April - June	<i>a</i>
Late YOY	50 – 95	183-m haul seines	August - March	<i>b</i>
Pre-fishery	131 – 267	183-m haul seines	April - March	<i>c</i>
Fully Recruited	≥ 268	183-m haul seines	April - March	<i>d</i>

Striped Mullet, *Mugil cephalus*

Striped mullet, *Mugil cephalus*, is one of Florida's most abundant and widespread estuarine-dependent fishes (Odum 1970; Leard et al. 1995). Striped mullet supported a valuable commercial fishery from the early 1960s through the late 1980s, with approximately 90% of all U.S. landings occurring in the Gulf of Mexico (Gulf) and over 80% of all commercial landings occurring in Florida waters (Rivas 1980; Leard et al. 1995). Changes in landings were documented from 1991 to 1994 when commercial striped mullet landings in Florida severely declined from 79% to 46% of the total Gulf production (Leard et al. 1995). Following the implementation of the Florida net limitation referendum (July 1, 1995), which eliminated the use of entangling nets within three miles of the Atlantic coast and nine miles of the Gulf coast, commercial landings have declined to an annual average of 8.1 million pounds from the recent historical (1967-1990) average of 25 million pounds (Mahmoudi 2005). After an initial decline in fishing effort following the net limitation ban in 1995, annual landings have gradually increased (Mahmoudi 2000; Mahmoudi 2005). Despite these increases, overall fishing mortality rates have declined substantially during the post net-limitation period, resulting in a significant increase in overall stock size and spawning stock biomass in recent years. Stocks throughout the state of Florida are healthy, and current levels of fishing effort appear to be sustainable (Mahmoudi 2005). Currently, cast nets are used in both the recreational and commercial fisheries.

Striped mullet form large schools in estuarine and nearshore waters from October to December, prior to their migration offshore. These schools migrate to offshore spawning areas over the outer continental shelf and slope during the passage of weather fronts from October through February. Typically, young-of-the-year (YOY) striped mullet recruit to Florida's estuaries at 20 to 35 mm standard length (Kilby 1949; Futch 1966). Recruitment usually begins in January and continues through April, with peaks in abundance during February and March; however, length-frequency data indicate that recruitment can occur in Florida's estuaries as early as the end of December.

Recruitment indices for YOY striped mullet collected in select Florida estuaries were developed to assess long-term trends in the YOY abundance and to predict potential future stock fluctuations in the adult population. Analyses were limited to the occurrence of YOY

(< 35 mm SL) striped mullet collected in 21.3-m seines during stratified-random sampling (SRS) since 1996. Analyses were also limited to samples collected during months when striped mullet typically recruit into estuaries in Florida (January to April; FWC-FMRI unpublished data). Recruitment windows were determined through length-frequency analysis. Two major recruitment windows were used: January to April (Apalachicola, northeast Florida, and Tampa Bay) and January to March (Cedar Key, Charlotte Harbor, and the northern Indian River Lagoon). Data were included to calculate indices of recruitment for YOY striped mullet using the longest term datasets in Apalachicola Bay (1998 to 2007), Cedar Key (1997 to 2007), Tampa Bay (1996 to 2007), Charlotte Harbor (1996 to 2007), northeast Florida (2002 to 2007), and in the northern Indian River Lagoon (1998 to 2007) (Figure SP07-08). All zones not sampled consistently throughout the period being analyzed for each estuary were excluded.

Abundance estimates for YOY striped mullet varied among the bay systems. In Apalachicola Bay, annual abundances fluctuated from 1998 to 2007. An increasing trend was seen from 2000 to 2002, followed by a sharp decline in 2003, a general increasing trend through 2006, and a decline in 2007 (Figure SP07-08). Annual abundances in northeast Florida varied from 2002 to 2006 and declined sharply in 2007. Annual abundances in Tampa Bay were relatively stable with minor peaks in 1998 and 2001, and a large peak in 2006. Annual abundances in Cedar Key have generally fluctuated without trend, with minor peaks occurring in 1998, 2000, 2004, and a large peak in 2006. Annual abundances in Charlotte Harbor varied little from 1996 to 2007, with the exception of two strong peaks in 2001 and 2006. Annual abundances in the northern Indian River Lagoon peaked in 2001, declined sharply in 2002, and increased slowly until 2006. Annual abundances of YOY striped mullet in all of the estuaries decreased in 2007 from higher levels in 2006.

References

- Futch, C.R. 1966. The Florida black mullet. Florida Board of Conservation Marine Laboratory, Salt Water Fisheries Leaflet 6, St. Petersburg, Florida.
- Kilby, J.D. 1949. A preliminary report on the young striped mullet (*Mugil cephalus*) in two gulf coastal areas of Florida. Quarterly Journal of the Florida Academy of Sciences 11(1):7-24.
- Leard, R., B. Mahmoudi, H. Blanchet, H. Lazauski, K. Spiller, M. Buchanan, C. Dyer, and W. Keithly. 1995. The striped mullet fishery of the Gulf of Mexico, United States: a regional management plan. Gulf States Marine Fisheries Commission, Number 33, Ocean Springs, Mississippi.
- Mahmoudi, B. 1997. Status and trends of the Florida mullet fishery and an update on stock assessment. Florida Department of Environmental Protection, Florida Marine Research Institute, St. Petersburg, Florida.
- Mahmoudi, B. 2000. Status and trends in the Florida mullet fishery and an updated stock assessment. Florida Fish and Wildlife Conservation Commission, Florida Marine Research Institute, St. Petersburg, Florida.
- Mahmoudi, B. 2005. The 2005 update of the stock assessment for striped mullet, *Mugil cephalus*, in Florida. Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, St. Petersburg, Florida.
- Odum, W. E. 1970. Utilization of the direct grazing and plant detritus food chains by the striped mullet, *Mugil cephalus*. Pages 222-240 in J.J. Steele, editor. Marine food chains. Oliver and Boyd, Ltd., Edinburgh, Scotland.

Rivas, L.R. 1980. Synopsis of knowledge on the taxonomy, biology, distribution, and fishery of the Gulf of Mexico mullets, Pisces: Mugilidae. *In*: M. Flanderfer and L. Skupien editors, Proceedings of a workshop for potential fishery resources of the northern Gulf of Mexico. Mississippi-Alabama Sea Grant Consortium Publication MASGP-80-012.

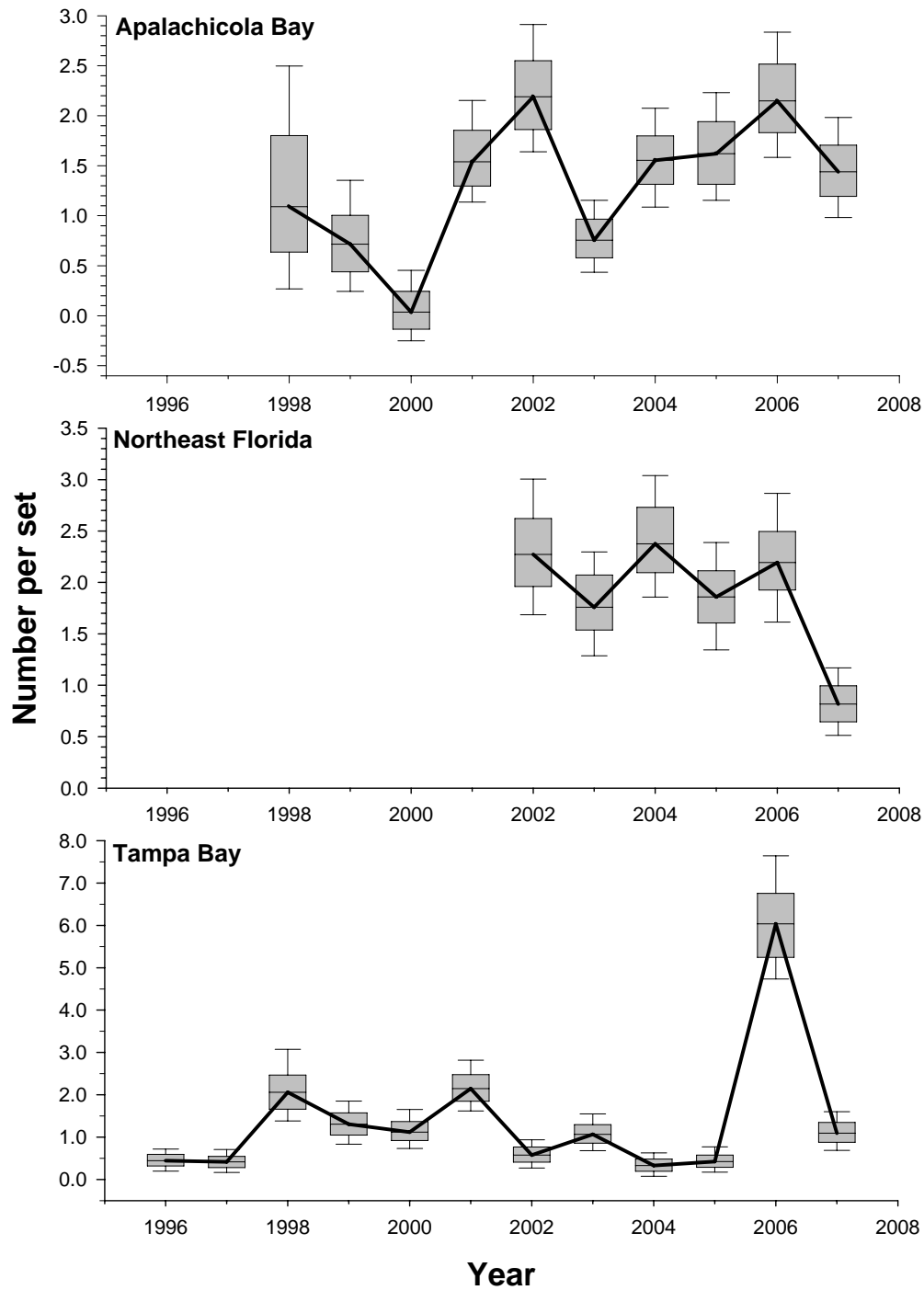


Figure SP07-08.

Indices of relative abundance for young-of-the-year striped mullet (<35 mm SL) collected using 21.3-m seines during stratified-random sampling surveys (January to April) in Apalachicola, Northeast Florida, and Tampa Bay. The box represents the 25th to 75th percentiles, the vertical line represents the 10th to 90th percentiles, and the horizontal line represents the median estimate. Note the different abundance scales for each system.

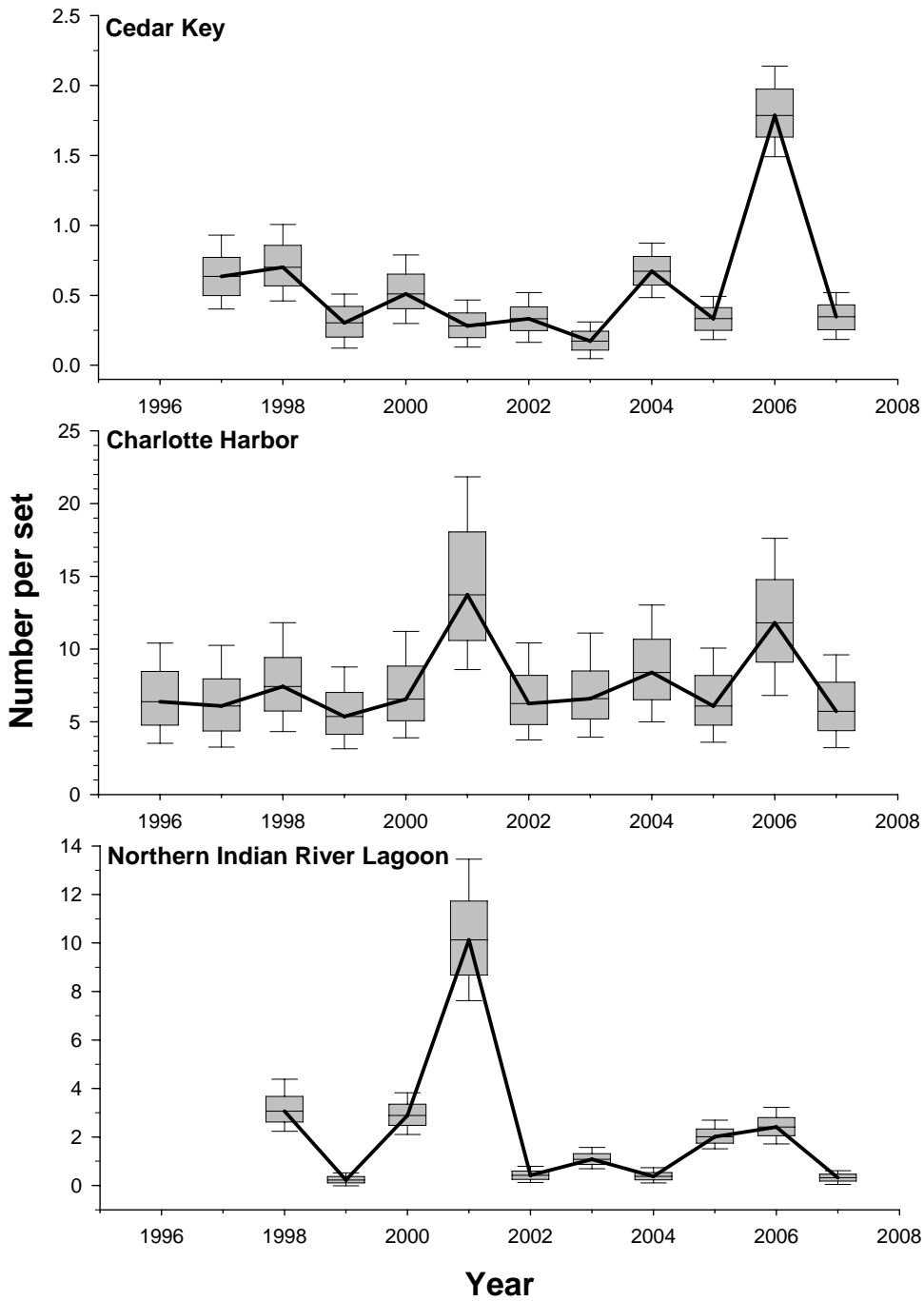


Figure SP07-08.

(Continued). Indices of relative abundance for young-of-the-year striped mullet (<35 mm SL) collected using 21.3-m seines during stratified-random sampling surveys (January to March) in Cedar Key, Charlotte Harbor, and the northern Indian River Lagoon. The box represents the 25th to 75th percentiles, the vertical line represents the 10th to 90th percentiles, and the horizontal line represents the median estimate. Note the different abundance scales for each system.

Pinfish, *Lagodon rhomboides*

The pinfish, *Lagodon rhomboides*, is an ecologically and recreationally important sparid found in marine and estuarine waters from Massachusetts to Texas (Bigelow and Schroeder 1953; Caldwell 1957). It is one of the most abundant resident species in estuaries of the northeastern Gulf of Mexico (Hoese and Jones 1963; Hansen 1970; Ogren and Brusher 1977). Densities of pinfish were found to be positively correlated to seagrass and drift algae cover (Rydene and Matheson 2003). Studies have shown that predation by pinfish plays a role in the organization of seagrass macrobenthic faunal assemblages (Young et al. 1976; Young and Young 1977). The pinfish is also a major link between primary and secondary production as individuals greater than 60 mm standard length (SL) consume and digest seagrasses and encrusting epiphytes (Stoner 1980; Weinstein et al. 1982; Montgomery and Targett 1992). Pinfish of all sizes are also commonly targeted by anglers for use as bait when fishing for recreationally important species such as sailfish (*Istiophorus platypterus*), red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), southern flounder (*Paralichthys lethostigma*), snook (*Centropomus undecimalis*), and gag (*Mycteroperca microlepis*).

To understand the mechanisms influencing recruitment of young-of-the-year (YOY) pinfish into selected Florida estuaries, annual indices of abundance (IOAs) were generated to determine if trends in YOY densities were evident in Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, Cedar Key, Apalachicola Bay, and northeast Florida. In these analyses, stratified-random sampling (SRS) data from 21.3-m seines deployed between January and June (1989 – 2007) were used. This period covered peak YOY recruitment into the estuaries (Nelson 1998). Only individuals measuring less than 80 mm SL were used in the analyses. This length represents the average maximum size that individuals of YOY cohorts generally attain through June (Nelson 1998). Due to historical changes in sampling design, only certain consistently sampled zones in each estuary were included to generate annual IOAs (Cedar Key = all Zones; Apalachicola Bay = Zones A, B, and C; northeast Florida = Zones A, B, C, and D; Tampa Bay = Zones A, B, C, D, E, K, L, and M; Charlotte Harbor = Zones A, B, C, M, and P; northern Indian River Lagoon = Zones C, D, F, and H). In addition, annual IOAs

were generated for sub-adult and adult pinfish (> 100 mm SL) collected between July and December (1996 – 2007) in the 183-m haul seine. Sampling in the southern Indian River Lagoon was conducted exclusively with the 183-m haul seine, therefore only IOAs for sub-adult and adult pinfish were produced from that area.

Trends of YOY pinfish relative abundance varied among and within most estuaries. Along the Gulf coast, YOY pinfish in Apalachicola Bay have exhibited a peak in abundance during 2001 followed by a general decreasing trend until increasing in 2007 (Figure SP07-09). Relative abundances of YOY pinfish in Cedar Key fluctuated widely with no apparent trends. Annual IOAs in Tampa Bay and Charlotte Harbor were high in the early 1990s, but since have generally declined (Tampa Bay) or remained at low levels (Charlotte Harbor). In northeast Florida, relative abundance of YOY pinfish has fluctuated year to year with the greatest abundances occurring between 2003 and 2005. In the northern Indian River Lagoon, highest relative abundance was observed in 1990 and was followed by a stable trend with occasional small peaks in 1992, 1996, 2003, and 2006.

Estimates of relative abundance of sub-adult and adult pinfish (>100 mm SL) also differed among estuaries. Along the Gulf coast, sub-adult and adult pinfish in Apalachicola Bay declined from 2001-2006 before peaking in 2007 (Figure SP07-10). Relative abundance of sub-adult and adult pinfish in Cedar Key reached a peak in 1998 and has since exhibited a subtle decreasing trend. In Tampa Bay there appeared to be a slight but consistent decline in annual abundance from 1996 through 2005 followed by small increases in relative abundances in 2006 and 2007. Relative abundance of sub-adult and adult pinfish in Charlotte Harbor increased from 1996-2000 and then declined through 2005 before increasing again beginning in 2006. In northeast Florida, relative abundance fluctuated from 2001 through 2006 before peaking in 2007. Relative abundance in the northern Indian River Lagoon increased starting in 1999, peaked in 2003, and has since declined through 2007. In the southern Indian River Lagoon, a peak in abundance in 1997 was followed by subtle fluctuations of high and low abundance followed by a small peak in 2007.

References

- Bigelow, H. B. and W. C. Schroeder. 1953. Fishes of the Gulf of Maine. U. S. Fish. Bull. 53: 577 pp.
- Caldwell, D. K. 1957. The biology and systematics of the pinfish, *Lagodon rhomboides* (Linnaeus). Bull. Fla. St. Mus. Biol. Sci. 2: 77-173.
- Hansen, D. J. 1970. Food, growth, migration, reproduction and abundance of pinfish, *Lagodon rhomboides*, and Atlantic croaker, *Micropogonias undulatus*, near Pensacola, Florida, 1963-65. U. S. Fish. Bull. 68(1): 135-146.
- Hoese, H. D. and R. S. Jones. 1963. Seasonality of larger animals in a Texas turtle grass community. Publ. Inst. Mar Sci. Univ. Tex. 9: 37-47.
- Montgomery, J. L. M. and T. E. Targett. 1992. The nutritional role of seagrass in the diet of the omnivorous pinfish *Lagodon rhomboides* (L.). J. Exp. Mar. Biol. Ecol. 158: 37-57.
- Nelson, G. A. 1998. Abundance, growth, and mortality of young-of-the-year pinfish, *Lagodon rhomboides*, in three estuaries along the gulf coast of Florida. Fish. Bull. 96: 315-328.
- Ogren, L. H. and H. A. Brusher. 1977. The distribution and abundance of fishes caught with a trawl in the St. Andrew Bay system. Northeast Gulf Science. 1(2): 83-105.
- Rydene, D. A. and R. E. Matheson. 2003. Diurnal fish density in relation to seagrass and drift algae cover in Tampa Bay, Florida. Gulf of Mexico Science 1: 35-58.
- Stoner, A. W. 1980. Feeding ecology of *Lagodon rhomboides* (Pisces: Sparidae): variation and functional responses. U. S. Fish. Bull. 78(2): 337-352.

Weinstein, M. P., K. L. Heck, Jr., P. E. Giebel, and J. E. Gates. 1982. The role of herbivory in pinfish (*Lagodon rhomboides*): a preliminary investigation. Bull. Mar. Sci. 32(3):791-795.

Young, D. K., M. A. Buzas, and M. W. Young. 1976. Species densities of macrobenthos associated with seagrass: a field experimental study of predation. J. Mar. Res. 34: 577-592.

Young, D. K. and M. W. Young. 1977. Community structure of the macrobenthos associated with seagrass of the Indian River estuary, Florida. pp. 359-381. *In*: B. C. Coull (ed.), Ecology of marine benthos. Belle W. Baruch Library in Marine Science 6. Univ. S. C. Press, Columbia.

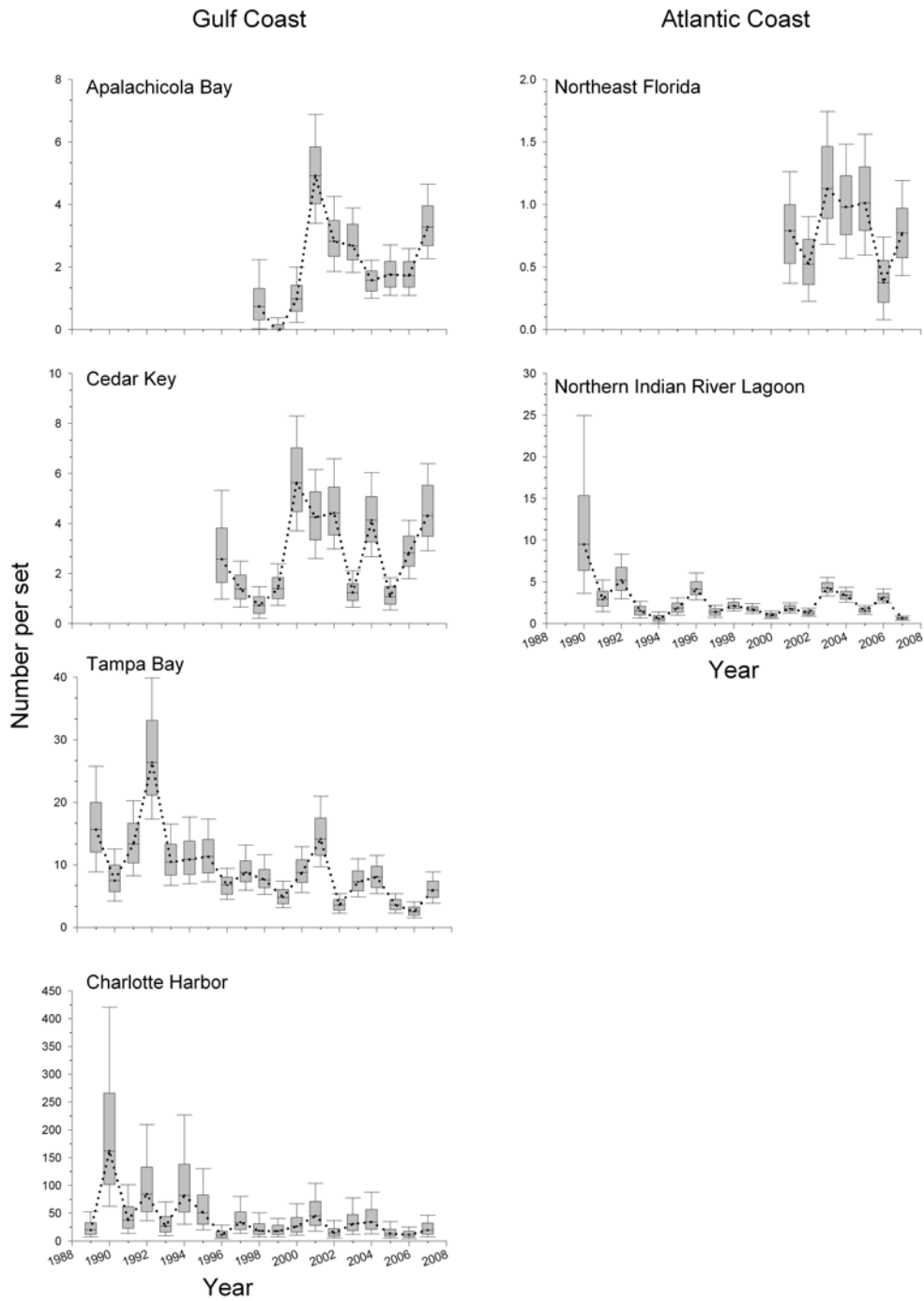


Figure SP07-09.

Annual relative abundance of YOY pinfish (<80 mm SL) collected in 21.3-m bay and river seines from January – June stratified-random sampling in Apalachicola Bay, Cedar Key, Charlotte Harbor, Tampa Bay, northeast Florida and the northern Indian River Lagoon, 1996 – 2007. The box plots represents the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line indicates the median fish per set estimate.

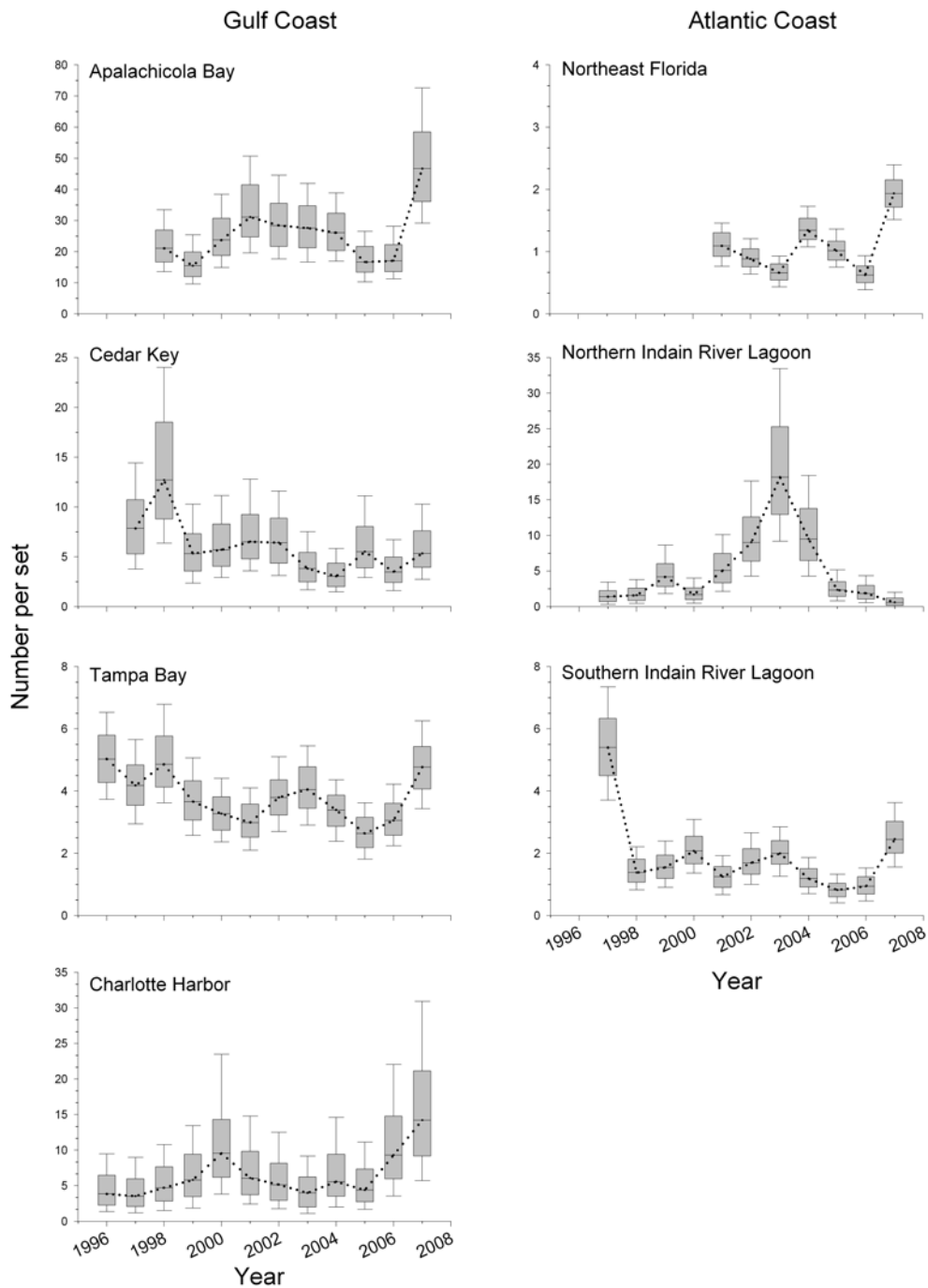


Figure SP07-10.

Annual relative abundance estimates of sub-adult and adult pinfish (> 100 mm SL) collected in the 183-m haul seine from July – December stratified-random sampling in Apalachicola Bay, Cedar Key, Charlotte Harbor, Tampa Bay, northeast Florida, and northern and southern Indian River Lagoon, 1996 – 2007. The box plots represent the 25th – 75th percentiles, the vertical lines extend from the 10th – 90th percentiles, and the horizontal line represents the median fish per set estimate.

Common snook, *Centropomus undecimalis*

Common snook, *Centropomus undecimalis*, are found in estuaries, adjacent rivers, and in nearshore waters of the tropical and subtropical western Atlantic (Gilmore et al. 1983; Rivas 1986). This species supports an important recreational fishery in Florida and is one of the most popular gamefish in state waters. There has been no legal commercial harvest of common snook in Florida since the State Legislature declared it a gamefish in 1957 and prohibited its sale. The median total snook harvest on both the Atlantic and Gulf of Mexico (Gulf) coasts during the past 20 years has been variable but generally increasing (Muller and Taylor 2006). Recent estimates of transitional spawning potential ratios were below 40% on both coasts and common snook are therefore considered overfished; if current fishing mortality rates continue, this species will remain overfished (Muller and Taylor 2006).

In Florida, common snook populations from the Atlantic and Gulf coasts have been genetically identified as separate stocks and are therefore managed separately (Tringali and Bert 1996; Taylor et al. 1993). Histological evidence shows that common snook are protandric hermaphrodites, i.e., they begin life as males and some become females after maturation (Taylor et al. 2000). The reproductive season for common snook on both coasts of Florida extends over at least six months – on the Gulf coast from April – September, and on the Atlantic coast from April – October (Taylor et al. 1998).

In an effort to monitor year-class strength and to improve the ability to predict future adult common snook abundances, the Fisheries-Independent Monitoring (FIM) program develops annual young-of-the-year relative abundance indices for juvenile common snook (≤ 50 mm SL) in selected Florida estuaries. Data from stratified-random 21.3-m river seine samples were examined to assess the recruitment of juvenile common snook in estuaries representative of the Florida Gulf and Atlantic coasts: Tampa Bay (1989 – 2007) and northern Indian River Lagoon (1999 – 2007). The majority of juvenile common snook were captured in riverine habitats from August to November in Tampa Bay and from July to February in the northern Indian River Lagoon. Data from this habitat type and these specific time periods were used in developing

relative abundance indices for juvenile common snook. Indices were not calculated for estuaries where 21.3-m seines were not deployed, where limited data were available, or from estuaries to the north of the typical range of common snook.

The FIM program also monitors the abundance of large juvenile and adult common snook (≥ 100 mm SL) in Florida estuarine systems within the range of this species, including Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, and southern Indian River Lagoon. Data from stratified-random 183-m haul seines between 1996 and 2007 were used to develop relative abundance indices for these large juvenile and adult fish.

On Florida's Gulf coast between 1989 and 2007, relative abundance estimates for juvenile common snook in Tampa Bay were relatively stable, with pronounced increases in 1999 and in 2006 (Figure SP07-11). On Florida's Atlantic coast, relative abundance estimates for juvenile common snook in the northern Indian River Lagoon have generally varied without trend from 1999 – 2007, except for one pronounced decrease in 2004.

For large juvenile and adult common snook on Florida's Gulf coast, estimates of relative abundance from Tampa Bay increased from 1996 – 1999 and then remained stable with little variation from 2000 – 2007 (Figure SP07-12). Relative abundance estimates for large juveniles and adults from Charlotte Harbor increased from 1996 – 2001 and varied without trend from 2002 – 2007 at abundance levels comparable to 1997 – 2000. In the northern Indian River Lagoon relative abundance estimates for large juvenile and adult common snook have generally varied without trend from 1997 – 2007. In the southern Indian River Lagoon, relative abundance estimates displayed an overall declining trend since sampling began in 1997.

References

- Gilmore, R. G., C. J. Donahoe and D. W. Cooke. 1983. Observations on the distribution and biology of the common snook, *Centropomus undecimalis* (Bloch). Florida Scientist 46:313–336.
- Muller, R. G. and R. G. Taylor. 2006. The 2005 stock assessment update of common snook, *Centropomus undecimalis*. Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute. 137 p.
- Rivas, L. R. 1986. Systematic review of the perciform fishes of the genus *Centropomus*. Copeia 1986(3):579–611.
- Taylor, R. G., J. A. Whittington, and H. J. Grier. 1993. Biology of common snook from the east and west coasts of Florida. Study 3, Sect. 1. In: Investigations into nearshore and estuarine gamefish distributions and abundance, ecology, life history, and population genetics in Florida (R. E. Crabtree, T. M. Bert, and R. G. Taylor, eds.) FDNR/FMRI Rep. No. F0165-F0296-88-93-C. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. pp 1–51.
- Taylor, R. G., H. J. Grier, and J. A. Whittington. 1998. Spawning rhythms of common snook in Florida. Journal of Fish Biology. 53:502–520.
- Taylor, R. G., J. A. Whittington, H. J. Grier, and R. E. Crabtree. 2000. Age, growth, maturation, and protandric sex reversal in common snook, *Centropomus undecimalis*, from the east and west coasts of South Florida. Fishery Bulletin 98:612-624.
- Tringali, M. D., and T. M. Bert. 1996. The genetic stock structure of common snook, *Centropomus undecimalis*. Canadian Journal of Fisheries and Aquatic Sciences 53:974-984.

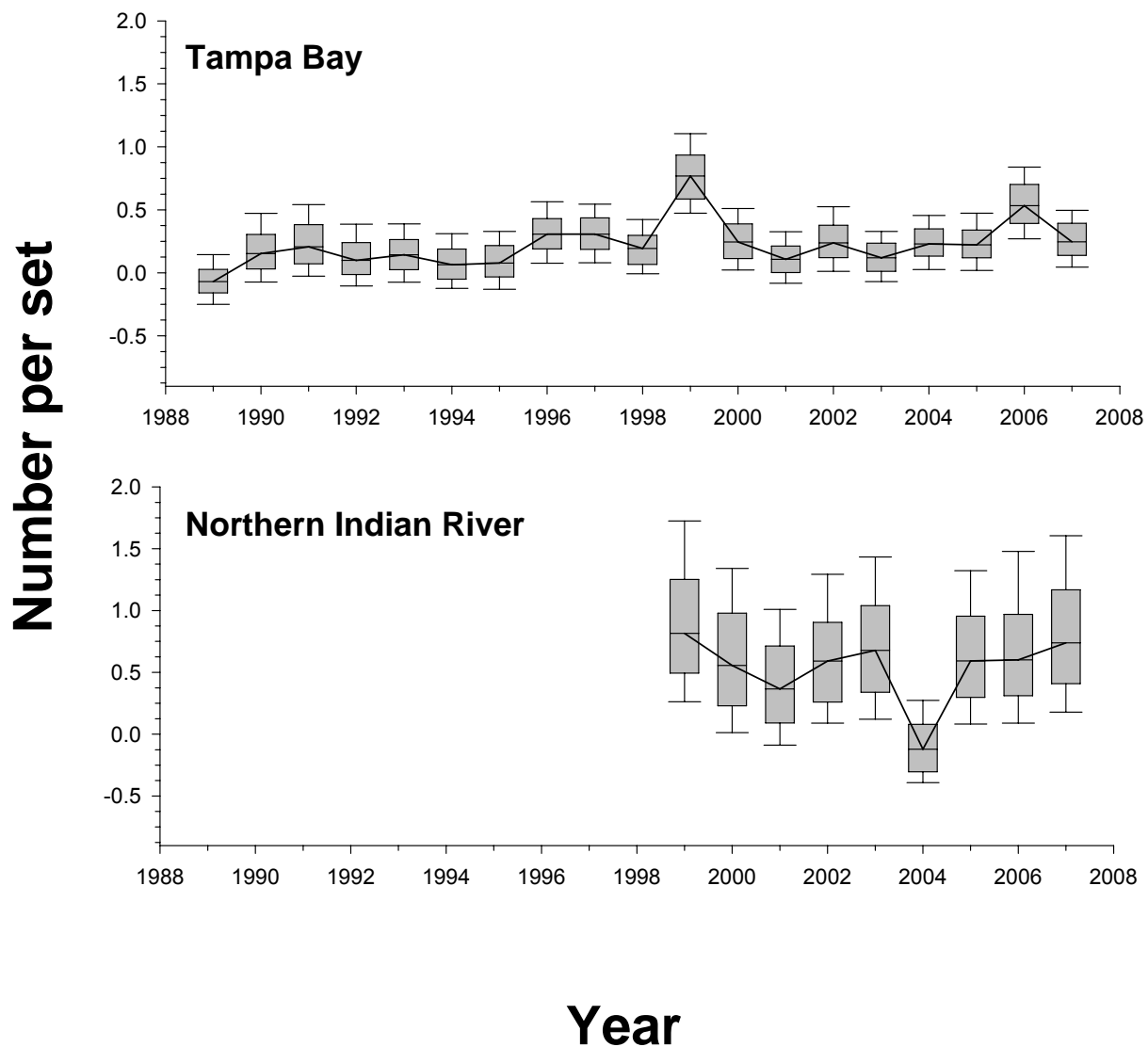


Figure SP07-11. Relative abundance of juvenile common snook (≤ 50 mm SL) collected in 21.3-m river seines from Tampa Bay (1989 – 2007) and northern Indian River Lagoon (1999 – 2007) during stratified-random sampling. The box represents the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line within each box indicates the median estimate.

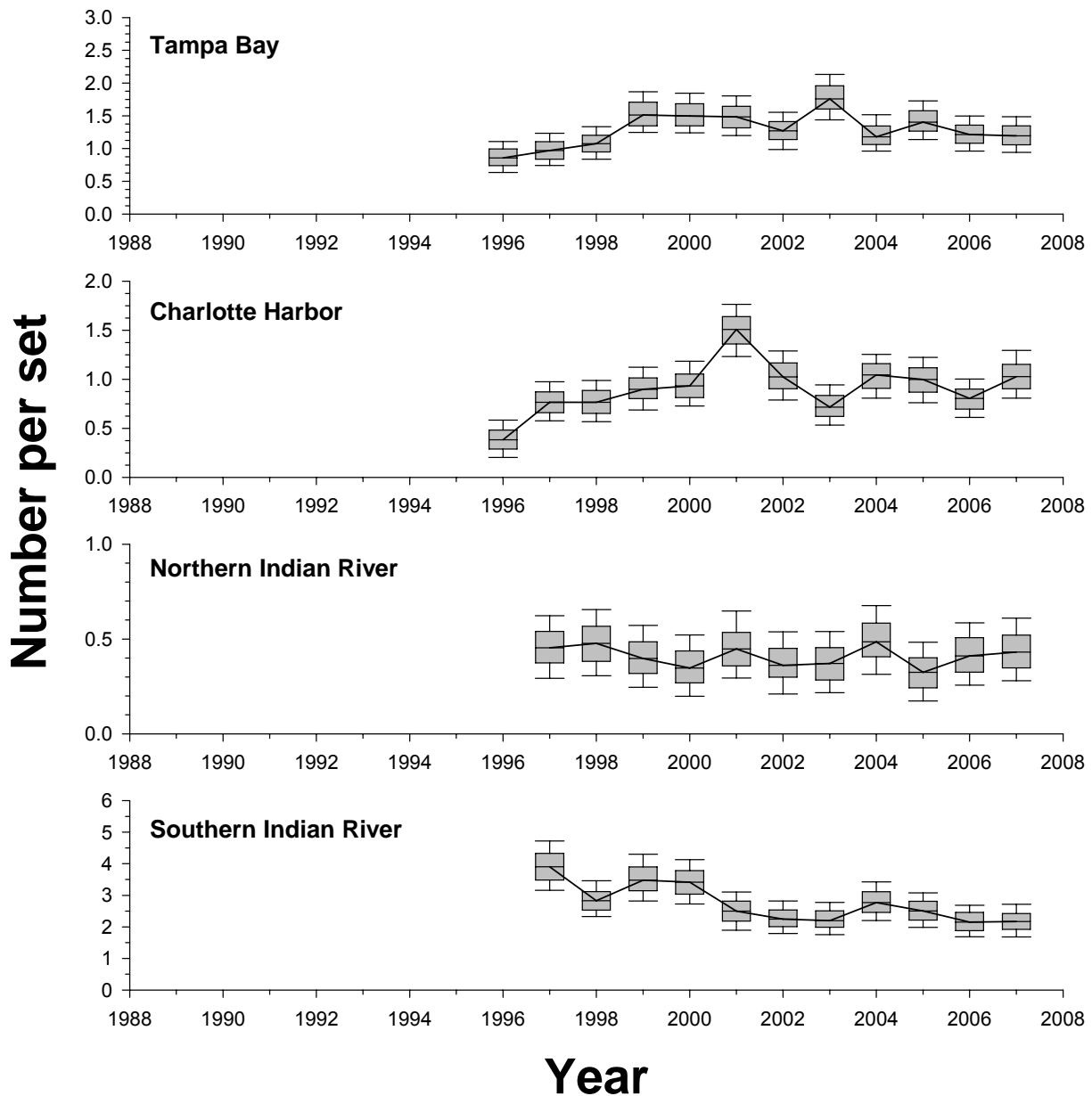


Figure SP07-12. Relative abundance of large juvenile and adult common snook (≥ 100 mm SL) collected in 183-m haul seines between 1996 and 2007 during stratified-random sampling from four Florida estuarine systems. The box represents the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line within each box indicates the median estimate. Note different scales for each system.

Intentionally Left Blank

Blue Crab, *Callinectes sapidus*

Valuable commercial and recreational fisheries exist for blue crabs (*Callinectes sapidus*) along the Atlantic and Gulf of Mexico (Gulf) coasts of Florida. From 1996 to 2004, Florida's Gulf coast commercial landings averaged 8.7 million pounds per year and were worth an estimated 6.9 million dollars annually (NMFS, 2004). In 1995, Florida legislation banned entanglement nets, raising concern that blue crab populations might experience increased fishing pressure from former net fishers. Even though annual gulf commercial landings peaked in 1998 at almost 13 million pounds, catch per unit effort was already beginning to decline (Steele and Bert, 1998). The lowest commercial landings of blue crab occurred in 2001 for the Gulf coast and 2002 for the Atlantic coast. Fishing effort for blue crabs has been limited in recent years by restricted species permits, but there have been no quotas for blue crab landings. Recreational harvest of blue crabs is unknown and not surveyed, so yearly catch may be much higher than the recorded commercial landings. In the recent blue crab stock assessment for Florida waters (Murphy et al., 2007); blue crab stocks have increased in abundance or biomass in recent years (2003-2005) and have shown a resiliency to fishing pressure.

Blue crabs are an integral part of the estuarine ecosystem. Blue crabs scavenge carrion and prey on juvenile fishes, mollusks, and crustaceans. They also play a valuable role in controlling populations of other estuarine species. In areas with depleted blue crab populations, mollusks that graze on *Spartina alterniflora* can become overpopulated and contribute to salt marsh die-offs (Sillman and Bertness 2002). Blue crabs also serve as prey for important gamefish species such as black drum (Simmons and Breuer 1962), red drum (Gunter 1945; Scharf and Schlicht 2000), snook (Blewett et al. 2006), and cobia (Meyer and Franks 1996). In addition to predation and harvest by humans, populations of blue crabs are affected by a myriad of other factors such as fresh water inflows (Wilber 1994), pesticides, disease, and habitat alteration.

Data collected from the Fish and Wildlife Research Institute's Fisheries-Independent Monitoring (FIM) program was used to generate indices of relative abundance (IOAs) for juvenile and adult blue crabs in selected Florida estuaries. These IOAs allow monitoring of relative year-class strength, correlation of juvenile abundances

with subsequent adult abundances, and the ability to better predict future adult blue crab abundances. Data collected from stratified-random 21.3-m bay and river seines were used to assess the recruitment of juvenile blue crabs (≤ 80 -mm carapace width [CW]) in Apalachicola Bay, Cedar Key, Charlotte Harbor, Tampa Bay, northern Indian River Lagoon, and northeast Florida. Blue crabs less than or equal to 80-mm CW were labeled as juveniles based on published data by Steele and Bert (1994) and Archambault et al. (1990). Both studies indicated that crabs less than 80-mm CW can be assumed to be immature. Because there is a carapace-width range for maturity, some crabs labeled as adults (> 80 -mm CW) for the purposes of these analyses may still be immature. A recruitment window of August through March was chosen based on monthly length frequency diagrams of 21.3-m seine data which showed that recently-settled blue crabs (≤ 20 -mm CW) were most abundant during this time period, although recruits were collected during all months of the year. Spawning in Florida waters generally occurs from March through October with some spawning reported during winter months (Steele and Bert 1994). Winter spawning is considered less common, yet is supported by the fact that recruits are found year-round. Data from August through December of each year were combined with data from January through March of the following year to create a biological year of data. This method produced a 2006 IOA that included data from both 2006 and 2007. The IOA value for 2007 does not include 2008 data (January – March), which were not yet available. Prior to 1996, sampling in Charlotte Harbor and Tampa Bay did not include all recruitment months due to a change in sampling strategy from seasonal to monthly sampling. Although sampling with 21.3-m seines occurred in northern Indian River Lagoon since 1990, the habitat sampled yielded very low numbers of juvenile crabs, so the IOA concentrates on two zones added after 1997 (Zones F and H) where juveniles are targeted more efficiently and show trends in abundance more accurately. Due to the time lag in the calculation of juvenile IOAs (August – March), the large crabs from a given year were most likely the parents of the juveniles in that year's IOA. This pattern was further supported by the way the two separate indices track each other relatively well.

The IOAs for juvenile blue crabs showed no consistent increasing or decreasing long-term trend for most regions. Instead, short-term increases or decreases in

abundance were apparent (Figure SP07-13). Juvenile trends in four estuaries showed a peak in abundance between 1998 and 2000: Charlotte Harbor and Tampa Bay in 1998, Cedar Key in 1999, and the northern Indian River Lagoon in 2000. Following these peaks, juvenile IOAs declined during the early 2000s on both coasts. For Tampa Bay, Charlotte Harbor, and Northeast Florida, there were peaks in abundance in 2003. Juvenile IOAs in the northern Indian River Lagoon have been steadily increasing from a low in 2001. In 2006, Tampa Bay and Apalachicola Bay showed increases in juvenile abundance. In fact, Apalachicola's 2006 index was significantly higher than all other years sampled. Overall, Apalachicola Bay had the highest juvenile catch rates in the state.

Data collected from 183-m haul seine nets were used to assess the abundance of larger blue crabs (>80 mm CW; Figure SP07-13). Data from January through December stratified-random sampling were used to calculate IOAs for these larger crabs. Sampling with the 183-m haul seine in all estuaries except Cedar Key and northern Indian River Lagoon did not begin until after January in the first year the gear was used. The 183-m haul seine data collected in the southern Indian River Lagoon are also shown for comparison. Adult blue crabs along the western Florida peninsula (Cedar Key, Tampa Bay, and Charlotte Harbor) experienced their lowest abundances in 1997. The adult IOAs for all estuaries, excluding the southern Indian River Lagoon and northeast Florida, demonstrated a peak in 1998 followed by a decline until about 2001 or 2002 and then reached a second peak between 2004 and 2006. The southern Indian River Lagoon abundances increased from a low in 2002 to a peak in 2005. Adult blue crabs in all four Gulf coast estuaries, and southern Indian River Lagoon, demonstrated drops in abundance from 2006 to 2007. Northeast Florida's 2007 index of abundance was significantly higher by Tukey post-hoc tests than all other years sampled in that estuary.

References

- Archambault, J. A., E. L. Wenner, and J. D. Whitaker. 1990. Life history and abundance of blue crab, *Callinectes sapidus* Rathbun, at Charleston Harbor, South Carolina. Bull. Mar. Sci. 46:145-158.
- Blewett, D.A., R.A. Hensley, and P.W. Stevens. 2006. Feeding habits of common snook, *Centropomus undecimalis*, in Charlotte Harbor, Florida. Gulf and Caribbean Research 18: 1-13.
- Gunter, G. 1945. Studies on marine fishes of Texas. Publications of the Institute of Marine Science, University of Texas 1(1):1-190.
- Meyer, G.H. and J. S. Franks. 1996. Food of cobia, *Rachycentron canadum*, from the Northcentral Gulf of Mexico. Gulf Research Reports. 9:161-167.
- Murphy, M.D., A.L. McMillen-Jackson, and B. Mahmoudi. 2007. A stock assessment for blue crab, *Callinectes sapidus*, in Florida waters. Report to the Florida Fish and Wildlife Commission, Division of Fisheries Management, In House Report 2007-006, June 22, 2007.
- NMFS (National Marine Fisheries Service). 2004. Fisheries Statistics and Economics Division. Website: www.nmfs.noaa.gov.
- Scharf, F.S. and K.K. Schlicht. 2000. Feeding habits of red drum (*Sciaenops ocellatus*) in Galveston Bay, Texas: Seasonal diet variation and predator-prey size relationships. Estuaries 23:128-139.
- Sillman, B.R. and M. D. Bertness. 2002. A trophic cascade regulates salt marsh primary production. Proceedings of the National Academy of Science of the United States of America 99:10500-10505.

- Simmons, E.G. and J.P. Breuer. 1962. A study of redfish, *Sciaenops ocellatus* Linnaeus and black drum, *Pogonius cromis* Linnaeus. Publications of the Institute of Marine Science, University of Texas 8:184-211.
- Steele, P. and T.M. Bert. 1994. Population ecology of the blue crab, *Callinectes sapidus* Rathbun, in a subtropical estuary: population structure, aspects of reproduction, and habitat partitioning. Florida Marine Research Publications 54:1-24.
- Steele, P., and T. M. Bert. 1998. The Florida blue crab fishery: History, status, and management. J. Shellfish Res. 17:441-449.
- Wilber, D.H. 1994. The influence of Apalachicola River flows on blue crab, *Callinectes sapidus*, in north Florida. Fishery Bulletin 92:180-188.

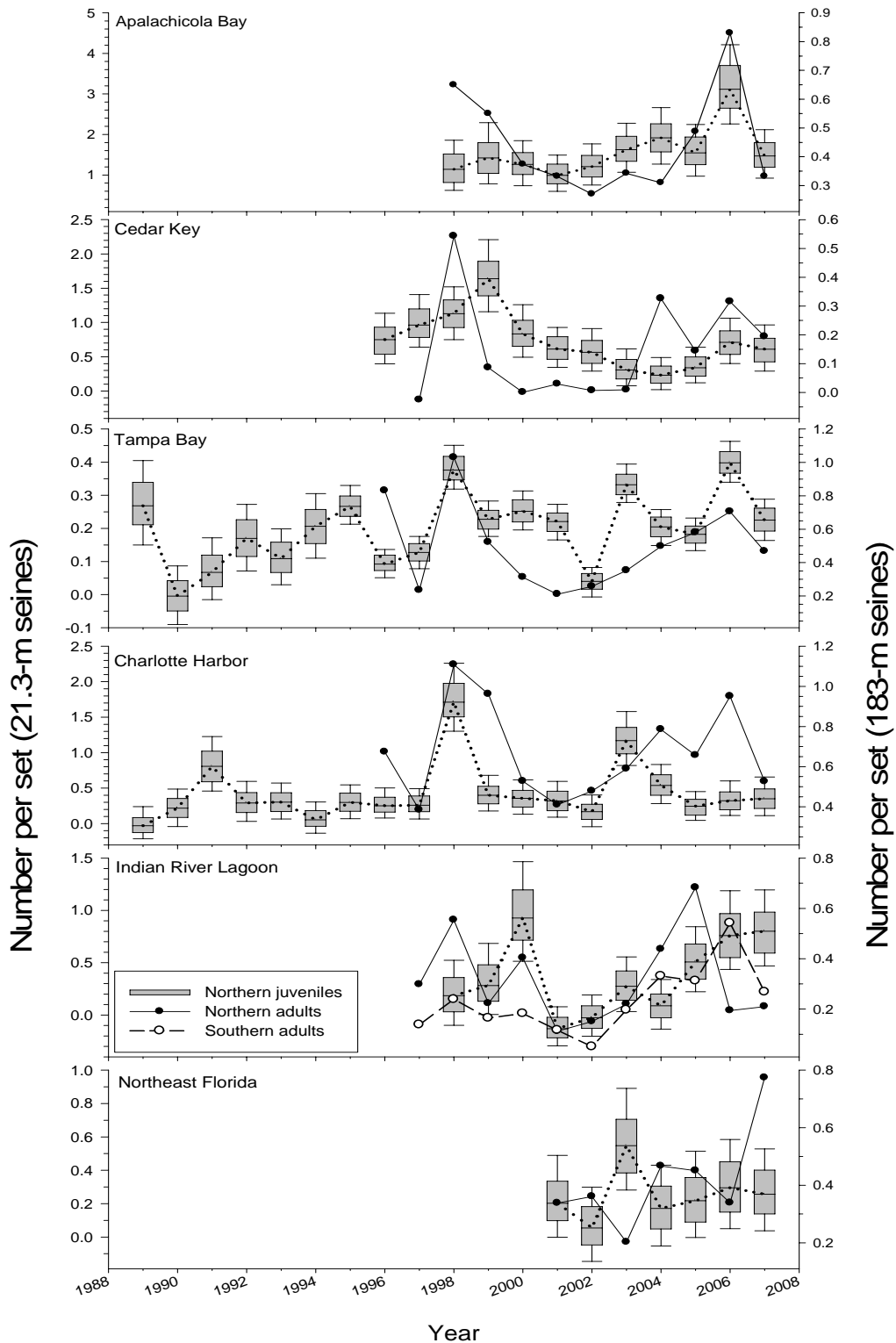


Figure SP07-13.

Index of abundance of juvenile blue crab (≤ 80 mm CW) collected in 21.3-m bay and river seines from August – March SRS, 1989 – 2007. The box represents the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line represents the median value. The line and scatter plots (●,○) represent median relative abundance of larger blue crabs (> 80mm CW) collected in all months using 183-m haul seines. Please note the change of scale on all of the graphs.